
ALSNews Vol. 214 January 22, 2003

Contents of This Issue:

1. ELECTROMIGRATION-INDUCED PLASTIC DEFORMATION

by Art Robinson
(Contact: NTamura@lbl.gov)

X-ray microdiffraction is joining x-ray imaging and spectromicroscopy in the arsenal of spatially resolved techniques at synchrotron radiation sources. At the Advanced Light Source, a collaboration comprising researchers from Stanford University, the ALS, Bell Laboratories (Lucent Technologies), and the Intel Corporation has "focused" on mapping with submicron spatial resolution the local crystalline orientation and strain/stress distributions in polycrystalline thin films. With this capability, they have made the first observation of plastic (permanent) deformation induced by electromigration in metal interconnects in computer microchips.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/59electromigration.html.

Publications about this research: N. Tamura et al., "High Spatial Resolution Grain Orientation and Strain Mapping in Thin Films Using Polychromatic Submicron X-Ray Diffraction," Appl. Phys. Lett. 80, 3724 (2002), and B.C. Valek et al., "Electromigration-Induced Plastic Deformation in Passivated Metal Lines," Appl. Phys. Lett. 81, 4168 (2002).

2. DOE'S WALTER STEVENS TOURS THE ALS

(Contact: DMNeumark@lbl.gov)

On December 17, the ALS welcomed Walter Stevens, new Director of the Division of Chemical Sciences, Geosciences, and Biosciences within DOE's Office of Basic Energy Sciences (BES). Having taken office on September 8, Stevens oversees a wide-ranging portfolio of basic research in atomic, molecular, and optical (AMO) science, chemical physics, photochemistry, radiation chemistry, physical chemistry, inorganic chemistry, organic chemistry, analytical chemistry, separation science, heavy-element chemistry, geochemistry, geophysics, and physical biosciences. He also serves as the principal point of contact at the DOE Office of Science for homeland defense and bioterrorism. His division directly supports the Chemical Dynamics Beamline (9.0.2), the AMO branches of Beamline 10.0.1, and the new Molecular Environmental Science (MES) Beamline (11.0.2) at the ALS. He also has a long-standing interest in structural biology that ripened during a 25-year career at the National Institute of Standards and Technology, where he had extensive management experience before joining BES in October 2000.

Stevens was hosted by Berkeley Lab Division Directors Dan Neumark (Chemical Sciences), Graham Fleming (Physical Biosciences), and Daniel Chemla (ALS). During his ALS visit, Stevens was updated on the status of the MES beamline by David Shuh (Chemical Sciences Division),

high-pressure x-ray photoelectron spectroscopy at Beamline 8.0.1 by Zahid Hussain (ALS), protein crystallography at superbend Beamline 8.3.1 by Fleming and James Holton (Berkeley Center for Structural Biology), the automated protein crystallography robot at Beamline 5.0.3 by Gerry McDermott (Berkeley Center for Structural Biology), and spectroscopy with circularly polarized x rays at Beamline 4.0.2 by Elke Arenholz (ALS). Stevens's tour concluded with a crossing of the storage-ring and booster-ring shielding tunnels, where ALS Deputy for Science Neville Smith provided a perspective of the historic ALS building.

3. DAVID AWSCHALOM COLLOQUIUM DRAWS OVERFLOW CROWD

(Contacts: awsch@physics.ucsb.edu, zhussain@lbl.gov)

As part of its continuing series of colloquia featuring leaders in research fields with a current or likely future connection to synchrotron radiation, on January 9, the ALS played host to Professor David D. Awschalom of the Department of Physics at the University of California, Santa Barbara, where he is the director of the Center for Spintronics and Quantum Computation. He is also associated with the Institute for Quantized Electronic Structures (iQUEST) and the new California Nanosystems Institute (CNSI). Before joining Santa Barbara in 1992, Awschalom was a research staff member and manager of the Nonequilibrium Physics Department at IBM's T.J. Watson Research Center in New York.

Currently, his research group is active in optical and magnetic interactions in semiconductor quantum structures, spin dynamics and coherence in condensed-matter systems ("spintronics"), macroscopic quantum phenomena in nanometer-scale magnets, and implementations of quantum computation in the solid state. Principal experimental techniques include low-temperature, femtosecond-resolved magnetooptical spectroscopies (to reveal the ultrafast spin dynamics), all-optical NMR, near-field scanning optical microscopy (for <100-nm resolution), microfabricated Hall-bar and SQUID magnetometry, integrated micromechanical magnetometers, and atomic- and magnetic-force microscopy.

Speaking to an overflow crowd in the ALS mezzanine conference room, Awschalom called attention to the growing interest in the use of electronic and nuclear spins in semiconductor nanostructures as a medium for the manipulation and storage of classical and quantum information. Such spin-based electronics offer remarkable opportunities for exploiting the robustness of quantum spin states by combining standard electronics with spin-dependent effects that arise from the interactions between electrons, nuclei, and magnetic fields. He provided an overview of recent experiments, done mostly in his laboratory, on coherent electronic spin dynamics in semiconductors and quantum structures and discussed temporally and spatially resolved magnetooptical measurements that reveal an interesting interplay between electronic and nuclear spins. These kinds of experiments were used to explore the electronic, photonic, and magnetic control of electron and nuclear spins in a variety of nanostructures with an eye toward investigating the underlying physics for quantum information processing in the solid state.

4. CALL FOR ABSTRACTS: ALS COMPENDIUM 2002

(Contact: LSTamura@lbl.gov)

Every year, the ALS publishes a compendium of abstracts describing the work done, in whole or in part, at the ALS during the past calendar year. All users or user groups (including ALS staff members) should submit a one- to three-page abstract (including figures) describing each project conducted at the ALS during calendar year 2002 (January 1 to December 31), whether published, unpublished, or in progress. The submission deadline is February 18, 2003. Detailed information on submitting abstracts can be found online at http://alspubs.lbl.gov/Compendium_old.

The abstracts received will be published on a CD that will be included in the back of the 2002 ALS Activity Report. Like last year, we will again accept electronic files in a number of formats, preferably PDF. The ALS thanks you for your cooperation in this effort to demonstrate the breadth, depth, and importance of the ALS scientific program. If you have any questions, please contact Lori Tamura by email (LSTamura@lbl.gov), fax (510-495-2111), or phone (510-486-6172).

5. ALS ON COVER OF DOE THIS MONTH

The dedication of the MES beamline at the ALS was featured on the cover of the December 2002 issue of "DOE This Month," a newsletter published for the general public by the DOE's Office of Public Information (http://www.energy.gov/subscriptions/sub/doe_month/decdoe02.pdf). Pictured with Secretary Abraham are Daniel Chemla (ALS Director), David Shuh (MES project leader), and Charles Shank (Berkeley Lab Director). A brief write-up of the Secretary of Energy's visit can be found at http://www-als.lbl.gov/als/als_news/news_archive/vol.212_112702.html#2.

6. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
John Bradley (Lawrence Livermore National Laboratory)

Beamline 4.0.2
Chuck Fadley (Univ. of California, Davis, and Berkeley Lab)
Stephen Cramer (Univ. of California, Davis)

Beamlines 5.0.1, 5.0.2, 5.0.3
Al Stewart (Sugen, Inc.)
Peter Hwang (Univ. of California, San Francisco)
Nigel Walker (Tularik, Inc.)
Joy Huffman (The Scripps Research Institute)
Glen Spraggon (Novartis Institute for Functional Genomics)
Duncan McRee (Syrrx, Inc.)
Ursula Schulze-Gahmen (Berkeley Lab)

Beamline 5.3.2
Gary Mitchell (The Dow Chemical Company)
Stephen Urquhart (Univ. of Saskatchewan, Canada)
Harald Ade (North Carolina State Univ.)
Adam Hitchcock (McMaster Univ., Canada)

Beamline 6.1.2
Carolyn Larabell (Berkeley Lab)
Greg Denbeaux (Berkeley Lab)

Beamline 6.3.1
Yasuji Muramatsu (Japan Atomic Energy Research Institute)

Beamline 7.0.1
Z.Q. Qiu (Univ. of California, Berkeley)
Elaine Seddon (Daresbury Laboratory, UK)

Dan Dessau (Univ. of Colorado at Boulder)
Steve Kevan (Univ. of Oregon)

Beamline 8.2.2
Geoffrey Chang (The Scripps Research Institute)

Beamline 9.0.2
Andrew Kung (Academia Sinica, Taiwan)
Laurie Butler (Univ. of Chicago)
Terrill Cool (Cornell Univ.)
Darcy Peterka (Berkeley Lab)

Beamline 9.3.2
Phil Ross (Berkeley Lab)
Glenn Waychunas (Berkeley Lab)

7. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of December 11 - 16, December 17 - 23, January 4 - 6, January 7 - 12, and January 13 - 19, the beam reliability (time delivered/time scheduled) was 98%. Of the scheduled beam, 88% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

LBNL/PUB-875
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

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ALSNews Vol. 215 February 5, 2003

Contents of This Issue:

1. SEGREGATION IN MIXED POLYMER BRUSHES

by Art Robinson
(Contact: A_Scholl@lbl.gov)

The chemical separation of mixed polymers into microphases represents a powerful and inexpensive tool for the fabrication of nanostructures. An international team comprising researchers from Germany and the Advanced Light Source has explored changes in the surface chemical structure of mixed polymer brushes exposed to different solvents. A brush consists of polymer chains chemically attached to a substrate. The team's observations, made with the photoemission electron microscope PEEM-2 at the ALS and an atomic force microscope (AFM), provide guidance for creating novel materials that adapt to their environment by changing their surface properties.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/60polymerbrush.html.

Publication about this research: S. Minko, M. Mueller, D. Usov, A. Scholl, C. Froeck, and M. Stamm, "Lateral versus Perpendicular Segregation in Mixed Polymer Brushes," Phys. Rev. Lett. 88, 035502 (2002).

2. SRI 2003 CALL FOR ABSTRACTS

(Contact: sri03@lbl.gov)

The Eighth International Conference on Synchrotron Radiation Instrumentation (SRI 2003) will be held August 25-29, 2003, at the Yerba Buena Center for the Arts in San Francisco, California. The conference, sponsored by the Stanford Synchrotron Radiation Laboratory and the ALS, will feature an exciting and comprehensive program covering new developments in synchrotron radiation sources and free electron lasers at photon energies from infrared to hard x rays, beamline instrumentation, and experimental techniques.

Contributed papers will be presented in oral and poster sessions. All meeting participants are invited to submit abstracts from which the presentations will be selected. Submission instructions and the abstract submission form are available at http://www.sri2003.lbl.gov/html/abstracts.html. The deadline for the submission of abstracts is Monday, March 3, 2003.

The main SRI 2003 Web page at http://www.sri2003.lbl.gov/ has additional information about SRI 2003, including a description of the meeting site; a preliminary program; online registration; accommodation, travel, and visa tips; tourist links; and a companion sightseeing program.

3. UPDATE ON ALS EXPANSION AND IMPROVEMENT PROJECTS

(Contact: SLRossi@lbl.gov)

Construction of a support building to provide needed staging areas in Sector 4 is substantially complete. Although a number of small tasks remain, we may begin to occupy the space while this work continues. The ongoing Southside Expansion Project in Sector 12 continues to make progress. The interior demolition has been completed, making way for the recent installation of hutches for new Beamlines 12.2.2 (high-pressure diffraction) and 12.3.1 (protein crystallography), currently under construction. Weather-related delays, however, are putting into question the original April completion date. We have received funding to begin design work for completing the build-out of the Building 6 mezzanine, which will provide much-needed office space in close proximity to the experiment floor. Construction bidding is to begin in April, with construction commencing when funding is received, tentatively by mid-year.

Planning for the April 2003 shutdown formally kicked off this month. Major jobs scheduled for this shutdown include the survey and alignment of the storage ring, scheduled replacement of the cryocoolers on all three superbend magnets in operation, and the installation of higher-order mode (HOM) dampers on third-harmonic cavities 1, 2, and 3.

4. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Jennifer Doudna
(Contact: doudna@uclink.berkeley.edu)

As the new Chair of the Users' Executive Committee, I want to extend an invitation to all users to contact the members of the UEC with concerns or questions regarding the ALS Users' Group. I look forward to coordinating the efforts of the UEC in support of science at our facility.

As you may know, the UEC represents the over one thousand users of the ALS in a variety of venues, including discussions with ALS, Berkeley Lab, and DOE leadership.

The current membership of the UEC is as follows:

John Bozek
(Advanced Light Source, Berkeley Lab, JDBozek@lbl.gov, 2002-04)
Gregory Denbeaux
(Center for X-Ray Optics, Berkeley Lab, GPDenbeaux@lbl.gov, 2003-05)
Dan Dessau
(University of Colorado, dessau@spot.colorado.edu, 2003-05)
Jennifer Doudna
(University of California, Berkeley, doudna@uclink.berkeley.edu, 2001-03, Chair)
Keith Jackson
(Center for X-Ray Optics, KHJackson@lbl.gov, Berkeley Lab, 2003-05)
Dennis Lindle
(University of Nevada, Las Vegas, lindle@nevada.edu, 2001-03)
Gerry McDermott
(Physical Biosciences Division, Berkeley Lab, GMcDermott@lbl.gov, 2001-03)
Gary Mitchell
(The Dow Chemical Company, gemitchell@dow.com, 2003-05)
Alexander Moewes
(University of Saskatchewan, moewes@usask.ca, 2002-04)
Yasuji Muramatsu
(Japan Atomic Energy Research Institute, murama@spring8.or.jp, 2002-04)
Eli Rotenberg
(Advanced Light Source, Berkeley Lab, ERotenberg@lbl.gov, 2002-04)

Sophie Canton
(Western Michigan University, SECanton@lbl.gov, 2002-04, Student Member)

I would like to thank outgoing Chair Roger Falcone for his excellent leadership and successful efforts during 2002, both in Berkeley and with our sponsors in Washington. I'd also like to thank previous Chair Harald Ade for his continuing efforts on behalf of the ALS in Washington.

To briefly introduce myself to you, I have recently joined the Berkeley faculty as a member of the Molecular and Cell Biology and Chemistry departments and have been conducting experiments at the ALS for about five years. My research focuses on understanding the molecular structure and function of RNA and RNA-protein complexes using x-ray crystallography.

Please contact me with your ideas for the ALS.

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

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John Bradley (Lawrence Livermore National Laboratory)
Gordon Brown (Stanford Univ.)
Ted Raab (Carnegie Institution of Washington)
Simon Clark (Berkeley Lab)
Raymond Jeanloz (Univ. of California, Berkeley)

Beamline 4.0.2
Chuck Fadley (Univ. of California, Davis, and Berkeley Lab)
Stefan Maat (IBM Almaden Research Center)

Beamlines 5.0.1, 5.0.2, 5.0.3
Timothy Osslund (Amgen)
Peter Hwang (Univ. of California, San Francisco)
Marc Jacobs (Vertex Pharmaceuticals)
Thomas Poulos (Univ. of California, Irvine)
Ning Zheng (Univ. of Washington)

Beamline 5.3.2
Adam Hitchcock (McMaster Univ., Canada)
Gary Mitchell (The Dow Chemical Company)

Beamline 6.3.2
David Allred (Brigham Young Univ.)

Beamline 8.0.1
Yasuji Muramatsu (Japan Atomic Energy Research Institute)
Oliver Hemmers (University of Nevada, Las Vegas)

Beamlines 8.2.1, 8.2.2
Jennifer Doudna (Univ. of California, Berkeley)
Wim Hol (Univ. of Washington)
John Kuriyan (Univ. of California, Berkeley)
Clare Peters-Libeu (Univ. of California, San Francisco)

Beamline 9.0.2
Laurie Butler (Univ. of Chicago)
Darcy Peterka (Berkeley Lab)
Andrew Kung (Academia Sinica, Taiwan)

Beamline 10.0.1
Alessandra Lanzara (Univ. of Rome)
Dan Dessau (Univ. of Colorado at Boulder)
Nora Berrah (Western Michigan Univ.)

Beamline 10.3.2
Frederic Panfili, Tatiana Kirpitchikova, Alain Manceau (Univ. Joseph Fourier, France)

6. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user run of January 23 - 27, the beam reliability (time delivered/time scheduled) was 99%. Of the scheduled beam, 95% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 216 February 19, 2003

Contents of This Issue:

1. EUV LITHOGRAPHY WORK RECOGNIZED

(Contact: DTAttwood@lbl.gov)

A multilab effort to develop extreme ultraviolet (EUV) lithography into the computer-chip-making technology of the future has been recognized with a 2003 Federal Laboratory Consortium (FLC) Excellence in Technology Transfer Award. Researchers from Berkeley Lab's Center for X-Ray Optics (CXRO), utilizing synchrotron light from ALS beamlines, played a crucial role in developing the technology that uses coated mirrors to bend and focus EUV light, which can then be used to define the ever-shrinking circuit features to be etched onto silicon chips. In fact, in a related development, CXRO researchers have reported the production of line widths as small as 39 nm using EUV lithography, compared to the lower limit of about 65 nm using current techniques. This work was recently highlighted in Physics News Update, a digest of physics news published by the American Institute of Physics (http://www.aip.org/enews/physnews/2003/624.html).

The judges for the FLC award consider the significance of the technology's impact on society as well as the success of the transfer of the technology from research lab to the public. The highly successful EUV project is a joint effort involving Lawrence Berkeley, Lawrence Livermore, and Sandia National Laboratories as well as a consortium of commercial partners including Intel, Advanced Micro Devices, IBM, Infineon, Micron Technologies, and Motorola. Largely because of this collaboration, EUV lithography is widely regarded as the most promising candidate to replace current lithography methods, making possible microprocessors 10 times faster with up to 10 times as many active transistors and memory chips that can store 40 times more information. Benefits would include such things as high-speed Internet access, instant global communications, throw-away microprocessors (smart cards), microcontrollers for more intelligent machinery, more powerful supercomputers for scientific and defense research, and countless other innovations.

2. "FATHER OF STXM" JANOS KIRZ TO SPEND SABBATICAL AT ALS

Janos Kirz, who is credited with being the "Father of STXM" (scanning transmission x-ray microscopy), will be spending a 10-month sabbatical at the ALS this year to perform soft x-ray diffraction experiments at Beamline 10.0.1. Kirz, a Distinguished Professor of Physics at Stony Brook University in New York, is the recipient of numerous honors and awards. In addition to pioneering the development of STXM instruments utilizing zone-plate lenses for x-ray focusing, he has participated in two R&D 100 award-winnning teams: one in 1990 with Harald Ade et al. for the development of scanning photoemission microscopy (SPEM) and another in 1999 with Chris Jacobsen et al. for the development of cryo-STXM. His latest work involves a technique for reconstructing high-resolution images of frozen, hydrated yeast cells from recorded soft x-ray

diffraction patterns. According to Kirz, because such experiments are extremely "hungry for brightness," the ALS is the ideal place to be.

In a way, this is a homecoming for Kirz, who first came to Berkeley in 1957 after the Soviet army suppressed the 1956 uprising in his native Hungary, leading to the exodus of 2% of the country's population. Kirz went on to spend his undergraduate, graduate, and postdoctorate years at Berkeley and worked in high-energy physics here as part of the Alvarez Group. However, in 1972 Kirz was sidetracked into what he says had been a "dead subject"--zone-plate lenses--by David Sayre's suggestion of using electron beams to produce the precisely spaced concentric diffraction zones that such lenses use to focus x rays. Kirz shared his expertise on the subject with the ALS community in two standing-room-only talks last month. In the first talk, he reviewed the history of zone plates and discussed current developments, including photon sieves and compound lenses. His second talk focused on the past, present, and future of high-resolution microscopes based on the detection of transmitted, scattered, or emitted photons.

3. SEND IN YOUR ABSTRACTS NOW FOR SRI 2003

(Contact: sri03@lbl.gov)

The deadline for submitting abstracts for oral or poster presentations at the Eighth International Conference on Synchrotron Radiation Instrumentation (SRI 2003) in San Francisco, August 25-29, 2003, is fast approaching! All meeting participants are invited to submit abstracts by Monday, March 3, 2003. Submission instructions and the abstract submission form are available at http://www.sri2003.lbl.gov/html/abstracts.html.

The main SRI 2003 Web page at http://www.sri2003.lbl.gov/ has additional information, including a description of the meeting site; a preliminary program; online registration; accommodation, travel, and visa tips; tourist links; and a companion sightseeing program.

4. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Jennifer Doudna
(Contact: doudna@uclink.berkeley.edu)

The UEC invites feedback from users regarding future directions for the ALS. We had a meeting with ALS management on February 18 to discuss a "20-year road map" for the ALS, which will also be presented to the Department of Energy's Office of Basic Energy Sciences at the end of the month. Check future issues of ALSNews for details on the road map. Also, as we begin thinking about the Users' Meeting scheduled for the fall, users are invited to suggest topics for presentations and workshops.

5. COMPENDIUM ABSTRACTS STILL BEING ACCEPTED

(Contact: LSTamura@lbl.gov)

It's not too late to submit abstracts for the 2002 ALS Compendium of User Abstracts. The deadline has been extended to March 3. All users or user groups (including ALS staff members) should submit a one- to three-page abstract (including figures) describing each project conducted at the ALS during calendar year 2002, whether published, unpublished, or in progress.

Submission information (including author guidelines, file specifications, and a submission form) can be found on the Web at http://alspubs.lbl.gov/Compendium_old. If you encounter problems uploading files via the Web, please notify Lori Tamura as soon as possible (LSTamura@lbl.gov, 510-486-6172). We are currently in the process of indexing the abstracts and sending out

acknowledgments; we ask for your patience as we work through the backlog of files that were received by yesterday's deadline. Many thanks to all those who submitted their work in a timely manner.

6. WHO'S IN TOWN: A SAMPLING OF ALS USERS

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Hoi-Ying Holman (Berkeley Lab)

Beamline 4.0.2
Luis Miguel Garcia Vinuesa (Univ. of Zaragoza, Spain)
Boris Sinkovic (Univ. of Connecticut)
Jo Stohr (Stanford Synchrotron Radiation Laboratory)

Beamline 6.3.1
Idir Mourad (Univ. Paris-Sud)

Beamline 7.0.1
Z.Q. Qiu (Univ. of California, Berkeley)
Byron Freelon (Berkeley Lab)
M. Zahid Hasan (Princeton Univ.)
Changyoung Kim (Yonsei Univ., Korea)

Beamline 7.3.1.1
Geoffrey Thornton (Manchester Univ., UK)

Beamline 8.0.1
Richard Saykally (Univ. of California, Berkeley)

Beamline 8.3.1
Cornelia Bellamacina, Neil Grodsky, Terence Hui, Isabelle Lehoux, Al Stewart (SUGEN, Inc.)
Bill Harries, Peter Hwang, Maia Vinogradova (Univ. of California, San Francisco)
Jonathan Parrish, Jason Lamore, Craig Garen, Ross Edwards (Univ. of Alberta, Canada)
Karolin Luger, Srinivas Chakravarty, Cindy White, Young-Jun Park, Gundimella Swamy (Colorado State Univ.)

Beamline 9.3.2
Suntharampillai Thevuthasan (Pacific Northwest National Laboratory)
Miquel Salmeron (Berkeley Lab)

Beamline 10.0.1
Nora Berrah (Western Michigan Univ.)
Laurent Duda (Uppsala Univ., Sweden)

7. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user runs of January 28 - February 2, February 4 - 9, and February 12 - 16, the beam reliability (time delivered/time scheduled) was 99%. Of the scheduled beam, 91% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 217 March 5, 2003

Contents of This Issue:

1. ALS PRESENTS LONG-RANGE VISION TO DOE

(Contact: NVSmith@lbl.gov)

How will the ALS look 20 years from now? The current vision, as presented to a Department of Energy (DOE) subcommittee last month, involves a light source cluster comprising an upgraded ALS, a Coherent Infrared Center (CIRCE), and a Linac-Based Ultrafast X-Ray Source (LUX). The cases for these developments were made to a subcommittee of the DOE's Office of Basic Energy Sciences (BES) Advisory Committee at a workshop in Rockville, Maryland, on February 22 - 23. The 20-Year BES Facilities Subcommittee, chaired by Sunil Sinha (Univ. of California, San Diego) and Geraldine Richmond (Univ. of Oregon), has been charged with reviewing proposals for major new facilities at BES-sponsored laboratories. The subcommittee's report will be instrumental in creating a 20-year roadmap guiding future developments at the DOE science laboratories. Presenting the case for the ALS upgrade and CIRCE were Neville Smith (ALS Deputy Director for Science), David Robin (Accelerator Physics Group Leader), and Michael Martin (Experimental Systems Group). Steve Leone (Chemical Science Division, Berkeley Lab) and John Corlett (Center for Beam Physics, Berkeley Lab) presented the case for LUX.

To read the full story, go to
http://www-als.lbl.gov/als/als_news/news_archive/vol.217_030503.html#1.

2. IN MEMORIAM: IRAN THOMAS

Iran Thomas, Deputy Director of DOE's Office of Basic Energy Sciences, died Friday, February 28, at his home. "Iran has left a remarkable legacy for the Office of Basic Energy Sciences, the Office of Science, the DOE laboratory system, and the scientific community," wrote Pat Dehmer, BES Director, in announcing Thomas's death. "Iran thought big, often really big. And, as a result, his accomplishments were many and great. He personally created a host of scientific programs and a large fraction of the BES major scientific user facilities that now dot the nation. During his 15-year reign as the Director of the Division of Materials Sciences and Engineering, he became synonymous with its programs and facilities. However, his most enduring legacy will be his philosophy and spirit of innovation, which he passed on to many of us both inside and outside of his DOE home. We will miss Iran greatly." Thomas is survived by his wife, Barbara, his daughters, Sharene and Lauren, and three grandchildren. Notes of condolence may be sent to Barbara at 10844 Game Preserve Road, Gaithersburg, Maryland 20879-3139.

3. SRI 2003 ABSTRACT DEADLINE EXTENDED

(Contact: sri03@lbl.gov)

The deadline for submitting abstracts for oral or poster presentations at the Eighth International Conference on Synchrotron Radiation Instrumentation (SRI 2003) in San Francisco, August 25-29, 2003, has been extended to Monday, March 17, 2003. All meeting participants are invited to submit abstracts online at http://www.sri2003.lbl.gov/html/abstracts.html.

SRI participants who have already submitted abstracts and wish to make changes may review and edit their abstracts at the Web page cited above.

The main SRI 2003 Web page at http://www.sri2003.lbl.gov/ has additional information, including a description of the meeting site; a preliminary program; online registration; accommodation, travel, and visa tips; tourist links; and a companion sightseeing program.

4. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS. (The ALS will be in two-bunch mode March 12 - 23.)

Beamline 1.4.3
Hoi-Ying Holman (Berkeley Lab)
Ted Raab (Carnegie Institution of Washington)

Beamline 4.0.2
Stefan Maat (IBM Almaden Research Center)
Reinhard Doerner (Univ. of Frankfurt, Germany)

Beamlines 5.0.1, 5.0.2, 5.0.3
Jinyu Liu, Shengfen Chen (Berkeley Lab)
Mark Knapp, Armando Villasenor (Roche Bioscience)
Kevin Parris (Wyeth-Ayerst Research)
Clare Peters-Libeu (Univ. of California, San Francisco)
Tom Pauly (Pfizer, Inc.)
Peter Hwang (Univ. of California, San Francisco)
Gyorgy Snell (Syrrx, Inc.)

Beamline 5.3.2
Rainer Fink (Univ. Erlangen, Germany)
Harald Ade (North Carolina State Univ.)

Beamline 6.1.2
Peter Fischer (Max Planck Institute for Metal Research, Germany)

Beamline 7.0.1
Laurent Duda (Uppsala Univ., Sweden)

Beamline 8.0.1
Eberhard Umbach (Univ. Wurzburg, Germany)
Dennis Lindle (Univ. of Nevada, Las Vegas)

Beamlines 8.2.1, 8.2.2
Kaushik Ghosh, Yingli Ma (Univ. of Pennsylvania)
Ailong Ke, Jennifer Doudna (Univ. of California, Berkeley)
Joseph Mougous (Univ. of California, Berkeley)
Jennifer Martin, Anna Aagaard, Cathy Latham (Univ. of Queensland, Australia)

Bhushan Nagar (Univ. of California, Berkeley)

Beamline 8.3.1
Kam Zhang, Graeme Card, Abhinav Kumar (Plexxikon, Inc.)
Gabriel Moncalian, John Jefferson Perry (Berkeley Lab)
Terence Hui, Isabelle Lehoux, Audie Rice, Al Stewart (SUGEN, Inc.)

Beamline 10.0.1
Alfred Mueller (Justus Liebig Univ., Germany)
Yoshiro Azuma (Photon Factory, Japan)

Beamline 10.3.1
Eleanor Blakely (Berkeley Lab)

5. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user runs of February 19 - 23 and February 25 - March 3, the beam reliability (time delivered/time scheduled) was 96%. Of the scheduled beam, 85% was delivered to completion without interruption. On February 19 there was a systemwide power outage. The time lost with this outage accounts for half of the total lost beam time for this two-run period.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

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Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov, ejmoxon@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 218 March 19, 2003

Contents of This Issue:

1. PUBLICATION CITATIONS NEEDED BY MARCH 24

(Contact: alsuser@lbl.gov)

If you have recently published any ALS-related work in a scientific journal or conference proceedings, or completed a Ph.D. thesis or received a patent based on work done at the ALS, please let us know by March 24 so that your work can be reported to the DOE as well as cited in the 2002 ALS Activity Report. Simply go to the User Services Online Forms Web page at http://alsusweb.lbl.gov/. Note that this page has recently been updated (see Item 2 below). Be sure to first use the "Search for Publications" option, to see if your publications have been previously entered into our database by a collaborator. If you see any errors in the database publications, please let the User Services Office know and they will correct them. Then, please use the "Submit Publication Listings" option and enter the information requested. Your timely response will be greatly appreciated, as it is imperative that we accurately report the number of ALS-related publications to the DOE and that we include them in our annual Activity Report.

2. CHANGES IN PUBLICATION SUBMISSION FORM ONLINE

(Contact: jptroutman@lbl.gov)

Users entering new publications into the ALS publications database via the ALS User Services Online Forms Web page (http://alsusweb.lbl.gov/) will notice a few changes that respond to new DOE requirements and that we hope make the process more user friendly and accurate as well. Contact information now need only be entered once per session. Information about the funding source of the work is now required. Conference presentations should be submitted only if included in published conference proceedings (abstract books do not qualify). Published conference proceedings include those published either online, as a book, or in a journal; in the latter two cases, be sure to select "conference proceedings" as the type of publication, rather than "book" or "journal."

Once the general information has been submitted, a second page will appear that is tailored to the type of publication selected. You can toggle between the first and second pages of the form without losing data by using either the "Submit General Info..." and "Update General Info..." buttons at the bottom of these pages or the "Forward" and "Back" buttons on your browser. When you are done entering the publication information on the second page, clicking the "Submit this Publication" button returns you to the General Information page, which can then be modified as needed for the next publication to be entered. If required information has not been entered, a page will appear listing what fields still need to be filled in to complete the submission process.

3. WIRMS 2003 ANNOUNCEMENT
(Contact: MCMartin@lbl.gov)

The International Workshop on Infrared Microscopy and Spectroscopy with Accelerator Based Sources (WIRMS 2003) will be held on July 8-11, 2003, at Granlibakken Conference Center, Lake Tahoe, California. This is the fourth in a series of international workshops focused on the exciting scientific opportunities offered by using synchrotrons and free-electron lasers as high-brightness infrared sources. The workshop will cover new developments in all aspects of the science, technology, and use of synchrotrons and free-electron lasers for infrared microscopy and spectroscopy. The deadline for submission of abstracts is April 1, 2003. For more information, please visit http://infrared.als.lbl.gov/WIRMS/.

4. SRI 2003 UPDATE
(Contact: sri03@lbl.gov)

Planning is well under way for the Eighth International Conference on Synchrotron Radiation Instrumentation (SRI 2003) to be held August 25-29, 2003, in San Francisco, California. Over 650 abstracts covering a wide range of topics including new developments in synchrotron radiation sources, free-electron lasers, beamline instrumentation, and experimental techniques were submitted before the March 17 deadline. The conference, sponsored by the Stanford Synchrotron Radiation Laboratory and the Advanced Light Source at Berkeley Lab, will take place at the Yerba Buena Center for the Arts, a cultural hub in downtown San Francisco that features the nearby Museum of Modern Art, fine dining, theaters, and shopping. Accommodations have been reserved at nearby hotels at reduced conference rates, and meeting attendees are urged to reserve as soon as their travel plans are complete to ensure the discounted rate.

The main SRI 2003 Web page at http://www.sri2003.lbl.gov/ has additional information, including a description of the meeting site; a preliminary program; online registration; accommodation, travel, and visa tips; tourist links; and a companion sightseeing program.

5. APPLY NOW FOR 2003-2004 DOCTORAL FELLOWSHIPS
(Contact: KGreen@lbl.gov)

The ALS is offering several doctoral fellowships in residence for the 2003-2004 academic year. Through these fellowships, qualified graduate students will gain hands-on experience in the use of synchrotron radiation by performing a major part of their thesis work at the ALS. Applicants must be full-time Ph.D. students pursuing synchrotron-radiation-based research in the physical or biological sciences and have passed all qualifying or comprehensive verbal and written examinations. Individuals from underrepresented groups are encouraged to apply. The deadline for applying is May 1, 2003.

The fellowships include a one-year appointment (with the possibility of renewal) and a $15,000 annual stipend. Fellows will be matched with an on-site mentor (generally a beamline scientist) and have access to ALS resources, including beam time. Fellows are expected to present their results at a meeting or as a seminar at the end of the fellowship year. More detailed information, along with links to frequently asked questions and the application form, can be found at http://www-als.lbl.gov/als/fellowships/.

6. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS. (The ALS will be running in two-bunch mode through March 23 and will be shut down for planned maintenance and installations starting March 31.)

Beamline 1.4.3
Hoi-Ying Holman (Berkeley Lab)

Beamline 4.0.2
Reinhard Doerner (Univ. of Frankfurt, Germany)
Stephen Cramer (Univ. of California, Davis)

Beamline 5.3.2
Adam Hitchcock (McMaster Univ., Canada)
Harald Ade (North Carolina State Univ.)
Gary Mitchell (The Dow Chemical Company)

Beamline 7.0.1
James Allen (Univ. of Michigan)
M. Zahid Hasan (Princeton Univ.)

Beamline 7.3.1.1
Z.Q. Qiu (Univ. of California, Berkeley)
Mahesh Samant (IBM Almaden Research Center)
Sebastien Raoux (Applied Materials, Inc.)

Beamline 7.3.3
Ersan Ustundag (California Institute of Technology)

Beamline 8.0.1
Dennis Lindle (Univ. of Nevada, Las Vegas)

Beamline 9.3.2
Suntharampillai Thevuthasan (Pacific Northwest National Laboratory)

Beamline 10.0.1
Yoshiro Azuma (Photon Factory, Japan)

Beamline 10.3.1
Eleanor Blakeley (Berkeley Lab)

Beamline 10.3.2
Daniel Grolimund (Paul Scherrer Institut, Switzerland)

7. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user run of March 4 - 10, the beam reliability (time delivered/time scheduled) was 99.9%. Of the scheduled beam, 90.4% was delivered to completion without interruption. For the user run of March 12 - 16 (two-bunch mode), the beam reliability was 92.3%. Of the scheduled beam, 85.9% was delivered to completion without interruption. During the two-bunch run there were complications with the Sector 8 superbend cryocooling system, which was switched to liquid cryocooling. The system will continue in this mode until the planned installation and maintenance

shutdown starting at 8:00 A.M. on Monday, March 31, 2002. User operations will resume at 8:00 A.M. on Wednesday, April 31, 2002.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

LBNL/PUB-875
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov, ejmoxon@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 219 April 2, 2003

Contents of This Issue:

1. MICROFOCUS ON NICKEL SEQUESTRATION IN SOILS

by Julie McCullough
(Contact: ACManceau@lbl.gov)

In the last two years, an international team comprising researchers from France and the ALS has developed new analytical capabilities that allow them to noninvasively peer into the heterogeneous world of soils and sediments and identify and quantify heavy metal contaminants at micrometer scales of resolution. The synergistic use of three powerful x-ray techniques--x-ray fluorescence (SXRF), diffraction (XRD), and absorption (XAFS)--allows the researchers to identify the molecular nature of the host mineral species and the trace metal's speciation, distribution, and coordination chemistry with micrometer spatial resolution. One of the difficulties in assessing the state of these metals is that the subsurface is extremely heterogeneous and becomes even more so at these scales, where heavy metals can exist as trace and major elements in mineral hosts. The researchers successfully applied their three-pronged approach to the speciation of nickel and zinc in a soil ferromanganese nodule using the microfocus capabilities of Beamlines 7.3.3 and 10.3.2.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/62nickel.html.

Publication about this research: A. Manceau, N. Tamura, M.A. Marcus, A.A. MacDowell, R.S. Celestre, R.E. Sublett, G. Sposito, and H.A. Padmore, "Deciphering nickel sequestration in soil ferromanganese nodules by combining x-ray fluorescence, absorption and diffraction at micrometer scales of resolution," American Mineralogist 87, 1494 (2002).

2. BESAC SUBCOMMITTEE RECOMMENDATIONS AVAILABLE ONLINE

(Contact: NVSmith@lbl.gov)

The report of the panel charged with reviewing proposals for future Department of Energy (DOE) science facilities is available online at http://www.sc.doe.gov/production/bes/BESAC/20%20year%20report.pdf. The panel, a subcommittee of the DOE's Basic Energy Sciences Advisory Committee (BESAC), sought to identify the projects with the highest potential for producing world-class research tools, considering both the importance of the science as well as the readiness of the proposed facilities for construction. The ALS (and Berkeley Lab) proposals include an ALS upgrade, a Coherent Infrared Center (CIRCE), and a Linac-Based Ultrafast X-Ray Source (LUX). More information on these proposals can be found online at http://www-als.lbl.gov/als/20/.

The panel strongly recommended that the DOE aggressively pursue funding for needed upgrades at all four DOE light sources. In response, the DOE has asked each of the four light sources to

provide input to help BES in planning its response to the BESAC recommendation. Regarding CIRCE (and a similar terahertz/far-infrared facility proposed by the Jefferson Laboratory), the panel encouraged the DOE to organize national workshops exploring the scientific advantages of the proposed facilities and to explore more fully some significant technical hurdles. With respect to LUX, the panel applauded the vision and innovation of the proposal, still in its earliest stages, and suggested the organization of national reviews of the science case, which are necessary before a national competition for such a new facility.

3. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Jennifer Doudna
(Contact: doudna@uclink.berkeley.edu)

The UEC met on March 18-19 to discuss issues relevant to ALS users, particularly with regard to the planned upgrades to the ring and insertion devices. A brief summary of the key agenda items at the meeting are included here, and, as always, user feedback and input to ongoing discussions are requested.

1. Proposed ALS upgrades (see ALSNews Item 2 above): Proposals pending at the Basic Energy Sciences (BES) office of the DOE include a change to "top-off" injection of the ring and a corresponding upgrade of insertion devices to keep the United States at the international cutting edge. UEC member Keith Jackson (kjackson@nafeo.org) is soliciting comments and input regarding the effects of these upgrades on users and will be convening a subcommittee to discuss upgrade impact and ways to minimize interference with experiments. Please forward questions and ideas about the proposed upgrades to Keith.

2. Planned user support building and on-site housing facilities: The new user support building will replace the current Building 10 adjacent to the ALS and will provide much-needed experimental and office space as well as seminar and meeting rooms. Plans are also in the works for new user housing adjacent to the ALS to provide low-cost short- and medium-term housing for users. UEC member Dan Dessau (dessau@spot.colorado.edu) is the chair of a subcommittee to provide input on the design of these facilities to ALS management.

3. Users' Meeting 2003: Eli Rotenberg (ERotenberg@lbl.gov) and Gerry McDermott (GMcDermott@lbl.gov) are the co-chairs of this year's meeting, which is scheduled for October 6-8. The theme for the meeting is "Looking back and ahead 10 years," featuring a retrospective of the past 10 years of ALS operation and a vision for the future of this world-class facility. Users are requested to provide ideas for workshops for the meeting, as well as possible workshop organizers.

4. UEC lobbying efforts in Washington: Greg Denbeaux (GPDenbeaux@lbl.gov) will be representing the ALS UEC during a lobbying trip to Washington on April 7-8 to raise awareness of the need for DOE support for synchrotron research. More about these efforts will be reported in a future ALS UEC Corner, so stay tuned.

Thanks for your support of the ALS, and, as always, please contact me or any UEC member with your ideas for the ALS.

4. SYNCHROTRON SUMMER SCHOOL RETURNS TO BERKELEY

(Contacts: nilsson@ssrl.slac.stanford.edu, attwood@eecs.berkeley.edu)

The third Berkeley-Stanford Synchrotron Summer School, to be held at Berkeley June 9-13, 2003, will provide basic lectures on the synchrotron radiation process, requisite technologies, and a broad range of scientific applications. Visits to both the ALS and the Stanford Synchrotron Radiation

Laboratory (SSRL) will be included, with opportunities to interact with the professional staff and graduate students at both facilities. The summer school will be limited to approximately 40 graduate students, with a preference for those pursuing doctoral research in the physical sciences in which synchrotron radiation is expected to play a significant role. The summer school is jointly sponsored by the University of California at Berkeley, Stanford University, Lawrence Berkeley National Laboratory, and the Stanford Synchrotron Radiation Laboratory. Lectures will be presented by professors and scientists from these four organizations and their user communities. The summer school will be housed at Berkeley's Clark Kerr campus. Co-chairs of the summer school are David Attwood (attwood@eecs.berkeley.edu) and Anders Nilsson (nilsson@ssrl.slac.stanford.edu).

Details describing the summer school, planned lectures, housing, and costs are posted at the Web site (http://www.unex.berkeley.edu/eng/synchrotron). Cost of attendance will be $625 for the one-week course (Sunday afternoon through Saturday morning), including lectures, a shared room, breakfast and lunch, and local transportation from the lecture site to the two synchrotron radiation facilities. Applications should include a brief academic record, a statement describing the intended research area and how a knowledge of synchrotron radiation would enhance those studies, a list of publications (if any), and information on how to reach the applicant by email and phone through the period extending to the time of the summer school. Applications are due by May 1, 2003, and can be sent electronically to Course6@unx.berkeley.edu.

5. HIGH-PRESSURE SCIENCE FEATURED ON DISCOVERY CHANNEL CANADA
(Contact: SMClark@lbl.gov)

High-pressure science at Beamline 7.3.3 received some popular international exposure last week as a featured segment on "Daily Planet," an hour-long science program that airs every week day on the Discovery Channel in Canada. A recent talk about studying phenomena at the pressures and temperatures in the Earth's core, given in Toronto by geophysicist and ALS user Raymond Jeanloz (Univ. of California, Berkeley), caught the imagination of Daily Planet segment producer Ivan Semeniuk, who arranged to have a film crew spend a few hours at the beamline with Jeanloz and beamline scientist Simon Clark. The finished segment, called "Journey to the Core," aired on March 27, 2003, and can be viewed online at http://www.exn.ca/dailyplanet/ (requires Windows Media Player). The segment explains how diamond-anvil cells, such as those used at Beamline 7.3.3, can produce pressures as high as 5.5 Mbar, nearly twice the pressure in the Earth's core. With laser heating, samples in the cell can also reach temperatures of over 5000 K. X rays from the ALS are then used to produce diffraction patterns that reveal the physical and chemical properties of the sample under investigation. The high-pressure work will eventually be moved to Beamline 12.2.2, which is currently under construction and is scheduled for commissioning later this summer.

6. GENERAL USER PROPOSAL SCORES POSTED ONLINE
(Contact: GFKrebs@lbl.gov)

The general user beam time allocation process for the running period from June through November 2003 is complete for the general sciences. The number of proposals for the cycle was 222, up from 197 in the previous period. The number of eight-hour shift requests increased from 3440 to 3932, an increase of about 15%. A total of 1981 shifts, equal to only 50% of the total time requested in the proposals, will be allocated. We will be unable to grant beam time to many excellent proposals. Competition for beam time on insertion-device beamlines was especially keen--for these beamlines, the ALS was able to grant only about 36% of the beam time requested. Requests for the insertion device beamlines will continue to find the proposal process for general users extremely competitive. For more detailed results, including beamline score distributions and cutoff scores, go to http://www-als.lbl.gov/als/quickguide/pspscores.html.

Beam-time requests for general users experiments are reviewed twice each year. A Proposal Study Panel (PSP) evaluates each proposal, providing the basis for granting beam time. The PSP is made up of eight scientists from a variety of synchrotron scientific disciplines. There is a separate PSP that reviews the crystallography proposals six times each year, allowing for a more rapid access. More information on the PSP and the general user proposal review process is available on the ALS web site http://www-als.lbl.gov/als/quickguide/independinvest.html.

7. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user run of March 19 - 23 (two-bunch mode), the beam reliability (time delivered/time scheduled) was 96%. Of the scheduled beam, 95% was delivered to completion without interruption. For the user run of March 25 - 31, the beam reliability was 97%. Of the scheduled beam, 88% was delivered to completion without interruption. There were no significant outages. The ALS shut down at 8:00 A.M. on Monday, March 31, 2003, for planned installations and maintenance. User operations will resume at 8:00 A.M. on Wednesday, April 30, 2003.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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LBNL/PUB-875
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

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ALSNews Vol. 220 April 16, 2003

Contents of This Issue:

1. SHUTDOWN 2003 ACTIVITIES PROCEEDING ON SCHEDULE

(Contact: SLRossi@lbl.gov)

We are currently in our third and final week of the maintenance and installation portion of the April 2003 shutdown. Machine startup will begin next week, followed by a few days of beamline commissioning, with light returning to users at 8:00 A.M. on April 30.

A survey of the storage ring and experiment floor has been completed, and while plans had been made to align the storage ring during the shutdown, it has been decided to forgo the alignment at this time. We normally align the storage ring on a two-year cycle, but had decided to see if undertaking this task on an annual basis would simplify the task. It was ultimately decided that the risks of aligning the storage ring at this time outweighed the benefits.

The cryocoolers on the three installed superbend magnets have been replaced as a part of regularly scheduled maintenance. The mechanical portion of the job has been completed well ahead of schedule, and the magnets are currently undergoing power cycling tests, a normal part of the procedure.

Installation of higher-order mode (HOM) dampers on third-harmonic cavities 1, 2, and 3 is largely complete; a few troubleshooting items remain. A number of other tasks have been completed during the shutdown, and as usual a large number of people have worked very hard to ensure their safe and timely completion.

2. RECENT PUBLICATIONS

Publications are the primary measure of the scientific productivity of a facility, and the scientific productivity of a facility is the primary metric that determines a facility's funding. If you have published any ALS-related work in a scientific journal or conference proceedings, or completed a Ph.D. thesis or received a patent based on work done at the ALS, please let us know so that your work can be reported to the DOE as well as cited in the 2002 ALS Activity Report. Simply go to the User Services Online Forms Web page at http://alsusweb.lbl.gov. Below is a sampling of a few ALS-related papers recently published.

Harries, J.R., J.P. Sullivan, J.B. Sternberg, S. Obara, T. Suzuki, P. Hammond, J. Bozek, N. Berrah, M. Halka, and Y. Azuma, "Double photoexcitation of helium in a strong dc electric field," Phys. Rev. Lett. 90(13), 133002 (April 2003).

Hellwig, O., T.L. Kirk, J.B. Kortright, A. Berger, and E.E. Fullerton, "A new phase diagram for layered antiferromagnetic films," Nature Materials 2(2), 112 (February 2003).

Margarit, S.M., H. Sondermann, B.E. Hall, B. Nagar, A. Hoelz, M. Pirruccello, D. Bar-Sagi, and J. Kuriyan, "Structural evidence for feedback activation by Ras·GTP of the Ras-specific nucleotide exchange factor SOS," Cell 112(5), 685 (March 2003).

Nagar, B., O. Hantschel, M.A. Young, K. Scheffzek, D. Veach, W. Bornmann, B. Clarkson, G. Superti-Furga, and J. Kuriyan, "Structural basis for the autoinhibition of c-Abl tyrosine kinase," Cell 112(6), 859 (March 2003).

Raty, J.Y., G. Galli, C. Bostedt, T. van Buuren, and L.J. Terminello, "Quantum confinement and fullerenelike surface reconstruction in nanodiamonds," Phys. Rev. Lett. 90(3), 037401 (January 2003).

Saes, M., C. Bressler, R. Abela, D. Grolimund, S.L. Johnson, P.A. Heimann, and M. Chergui, "Observing photochemical transients by ultrafast x-ray absorption spectroscopy," Phys. Rev. Lett. 90(4), 047403 (January 2003).

Spolenak, R., W.L. Brown, N. Tamura, A.A. MacDowell, R.S. Celestre, H.A. Padmore, B.C. Valek, J.C. Bravman, T. Marieb, H. Fujimoto, B.W. Batterman, and J.R. Patel, "Local plasticity of Al thin films as revealed by x-ray microdiffraction," Phys. Rev. Lett. 90(9), 096102 (March 2003).

Walden, H., M. Podgorski, and B.A. Schulman, "Insights into the ubiquitin transfer cascade from the structure of the activating enzyme for NEDD8," Nature 422(6929), 330 (March 2003).

Young, T.A., B. Delagoutte, J.A. Endrizzi, A.M. Falick, and T. Alber, "Structure of Mycobacterium tuberculosis PknB supports a universal activation mechanism for Ser/Thr protein kinases," Nat. Struct. Biol. 10(3), 168 (March 2003).

3. JOB OPPORTUNITIES AT THE ALS

Listed below are a few ALS-related positions that are currently available. For more detailed information on a specific job, go to the Berkeley Lab Current Job Opportunities Web page (http://cjo.lbl.gov/), type the Job Requisition Number (shown below in parentheses) into the keyword search box, and click on the "GO" button (do not use the "return" key). For a complete listing of ALS-related openings, search on the keywords "Advanced Light Source."

Student Assistant (013359). Summer employment for science and engineering college students. Assist with programmatic activities, such as taking data, working on accelerator hardware, and using the computer for simulations and calculations. Some positions may also include working with scientists and engineers to assist in the design and fabrication of technical components. Other positions may involve performing data entry into various information management systems, assisting technical staff with organization and storage of equipment and supplies within the ALS facility, and performing errands as needed.

Computer Systems Engineer I (013487). Intern position intended to provide a career path as well as build expertise and leadership in an individual with high potential of becoming a permanent member of the Software Engineering staff. Work in a small team-oriented environment to develop and support software controlling accelerator and beamline systems and collecting, managing, and processing scientific data. One-year term with the possibility of renewal and/or conversion to career.

Biophysicist Scientist/Engineer (015593). As a member of the Berkeley Center for Structural Biology (BCSB), provide technical and scientific support for users at the BCSB at the ALS. Work with BCSB scientists and engineers to develop methodology and instrumentation for collecting and

analyzing crystallographic data using synchrotron radiation. Participate on projects involving the structure determination of biological molecules and biomolecular complexes.

4. ALS STAFF PHOTO ON HOME PAGE

ALS staff members gathered atop the booster ring shielding on St. Patrick's Day for the annual staff photo. Check out who's wearing green and who's not at http://www-als.lbl.gov/.

5. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

The ALS is currently shut down for planned installations and maintenance. User operations will resume at 8:00 A.M. on Wednesday, April 30, 2003.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

LBNL/PUB-875
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 221 April 30, 2003

Contents of This Issue:

1. CAMPUZANO COLLOQUIUM: APPLYING ARPES TO SUPERCONDUCTIVITY

(Contact: ZHussain@lbl.gov)

"Breathtakingly beautiful experiments," was the reaction of one veteran practitioner of photoemission spectroscopy at the end of an ALS colloquium given by Juan Carlos Campuzano (University of Illinois at Chicago and Argonne National Laboratory) to a standing-room-only crowd on April 17. Campuzano's subject was the phase diagram of the high-temperature superconductors as seen by angle-resolved photoemission spectroscopy (ARPES). Campuzano's group has been one of the leaders in applying ARPES to the still-unanswered question of how high-temperature superconductors work, conducting its experiments at two different beamlines on the Aladdin storage ring of the University of Wisconsin Synchrotron Radiation Center. In his colloquium, Campuzano addressed two important boundaries in the phase diagram, which describes the ranges of temperature and composition within which the various phases (normal metal, superconductor, and so on) of these materials exist.

The most well known feature of the phase diagram is a dome-shaped region of superconductivity over a relatively small range of composition (doping) at low temperature. The superconducting phase transition in the low-doping (underdoped) composition range of high-temperature superconductors is rather unsual in that there is a pseudogap in the electronic excitation spectrum that appears at temperatures T* higher than Tc, while phase coherence and superconductivity are established at Tc. The first question Campuzano addressed was whether T* is just a crossover that is controlled by fluctuations in advance of an order that will be established at Tc or whether there is a spontaneously broken symmetry at T*. Using ARPES with circularly polarized light and a carefully controlled experiment geometry, Campuzano's group found that, in the pseudogap state, left circularly polarized photons result in a different photocurrent than right circularly polarized photons. The interpretation was that the state below T* breaks time-reversal symmetry. However, it remains unknown what the order is that is broken.

On the other hand, in the high-doping (overdoped) composition range, the group found evidence for a new crossover line in the phase diagram that divides a coherent metal phase (such as a normal Fermi liquid) at lower temperatures and higher doping from an incoherent metal phase (a strange metal) at higher temperatures and lower doping. For the composition corresponding to the top of the superconducitivity dome (optimally doped), the superconductor goes directly to the incoherent state upon being heated. The coherent phase is characterized by two well-defined spectral peaks in ARPES that are due to a coherent bilayer splitting, whereas the latter phase exhibits only a single broad spectral feature. To observe the crossover, the group had to "kill" the superconductivity by passing a current through the sample. This "flow-current" experiment tested the "pseudogap line" to see whether it terminates at the optimal doping or extends into the overdoped region. By flowing current to "kill" the superconductivity in the overdoped region, the researchers concluded that the pseudogap line extends to the overdoped region in Bi2212.

2. FIRST CALL: GENERAL SCIENCES PROPOSALS DUE JUNE 1
(Contact: alsproposals@lbl.gov)

The User Services Office is now accepting general user proposals from scientists who wish to conduct research in the general sciences at the ALS during the running period from December 2003 to May 2004. The deadline for submissions is June 1, 2003. (This deadline does not apply to protein crystallography proposals, which have a separate process and schedule.)

Scientists wishing to renew a previous proposal must download the one-page "ALS Experiment Report and Request for Beamtime" form (see links below) and submit it to the User Services Office by the June 1 deadline. The form is in Rich Text Format (RTF) and can be saved to your hard disk, filled out, and attached in an email message to alsproposals@lbl.gov with the key words "Experiment Report" in the subject header. Proposals cannot be renewed for more than three cycles after they are first submitted. After three rollover cycles, a new proposal must be submitted. If your proposal is designated ALS-00799 or lower, then you must submit a new proposal to be eligible for beamtime.

The numeric rating for each proposal will be communicated to the user along with comments from the Proposal Study Panel, where appropriate. The cutoff rating for each beamline in the previous proposal cycle is published on the Web (see below). The following resources are available for further information:

ALS User Services Administrator
alsuser@lbl.gov

General user proposal process
http://www-als.lbl.gov/als/quickguide/independinvest.html

ALS General Sciences Proposal and Request for Beamtime
http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/Page1P.shtml/Initialize

ALS Experiment Report and Request for Beamtime (renewal form)
http://www-als.lbl.gov/als/quickguide/expt_report.rtf

Beamline information
http://www-als.lbl.gov/als/als_users_bl/datasheets.html
http://www-als.lbl.gov/als/als_users_bl/bl_table.html

Proposal Study Panel (PSP) scores
http://www-als.lbl.gov/als/quickguide/pspscores.html

3. SCIENTIFIC ADVISORY COMMITTEE CONVENES FOR TWO-DAY SESSION
(Contact: GFKrebs@lbl.gov)

The ALS Scientific Advisory Committee (SAC) addressed a wide range of topics during a recent two-day meeting held at the ALS on April 22 - 23. The SAC is charged with advising Berkeley Lab and ALS management on issues relating to ALS operations, resource allocation, and strategic planning. At this latest meeting, the SAC's agenda included several reports relating to the Department of Energy Office of Science's request for their advisory committees to establish subcommittees to consider what new or upgraded facilities will best serve Office of Science purposes over a time frame of the next 20 years. The advisory committees were then charged with providing reports that discuss the importance of the science that the facilites would support and the

readiness of the facilities for construction. SAC member Sunil Sinha (Univ. of California, San Diego), co-chair of the Basic Energy Sciences Advisory Committee (BESAC) subcommittee, provided a briefing on the recommendations of his subcommittee. His counterpart from the Biological and Environmental Research Advisory Committee (BERAC) subcommittee, Janet Smith (Purdue Univ), also a member of the SAC, addressed the group via teleconference, summarizing her subcommittee's recommendations as they relate to x-ray light sources from the perspective of biology and environmental science. The SAC also heard about the three Berkeley Lab presentations: the ALS upgrade, CIRCE, and LUX.

Janos Kirz (Stony Brook Univ.), currently on sabbatical at the ALS, gave a talk on lensless imaging; Elke Arenholz (ALS) provided a status report on magnetic materials research; and Howard Padmore (Experimental Systems Group Leader), Nobumichi Tamura (ALS), and Ersan Ustundag (Caltech) updated the SAC on microdiffraction research at ALS beamlines. ALS Division Deputy for Science Neville Smith and SAC member Yves Idzerda (Montana State Univ. and chair of the ALS General Sciences Proposal Study Panel) led a discussion specifying procedures for the "Approved Program" mode of access. The meeting closed out with a discussion on actinide research and the benefits and risks of research involving hazardous materials (led by ALS Deputy Director Ben Feinberg, David Shuh of Berkeley Lab's Chemical Sciences Division, and John Joyce of Los Alamos National Laboratory). In attendance at this meeting were SAC members Samuel Bader (Argonne National Laboratory), James Berger (Univ. of California, Berkeley), Jennifer Doudna (Berkeley Lab), Yves Idzerda, Chair Stephen D. Kevan (Univ. of Oregon), Anders Nilsson (Stanford Synchrotron Radiation Laboratory/Stockholm Univ., Sweden), Sunil Sinha, Janet Smith, Donald. L. Sparks (University of Delaware), John Spence (Arizona State Univ.), Anthony Starace (Univ. of Nebraska-Lincoln), and Friso van der Veen (Paul Scherrer Institut).

4. CONGRESSIONAL DELEGATION TOURS ALS

Representative David Hobson (R-Ohio), the Chairman of the House Appropriations Subcommittee on Energy and Water Development--a key congressional panel for science funding--toured the ALS with two of his colleagues on April 25 as part of a larger visit to Bay Area national laboratories and water projects. Hobson, along with Rep. Marion Berry (D-Arkansas), and Rep. Michael Simpson (R-Idaho), met with senior Berkeley Lab management and heard about Lab programs such as advanced scientific computing (NERSC), the supernova satellite project (SNAP), and the Molecular Foundry. At the ALS, Director Daniel Chemla gave a brief introduction to how the ALS works, a few vital statistics, and a survey of future developments. The congressional delegation was then escorted to the experiment floor, where user Carolyn Larabell (Berkeley Lab's Life Sciences Division and the Univ. of California, San Francisco) gave an informal talk on how synchrotron light enables three-dimensional tomography of single cells. At Beamline 12.0.1, Erik Anderson, Ken Goldberg, and Patrick Naulleau (all of Berkeley Lab's Center for X-Ray Optics) described the implications for computer technology stemming from achievements in EUV lithography that have resulted from collaborations between three national laboratories and with industry. Hobson also stopped by a few workstations along the way and chatted with staff members Corie Ralston, Sue Bailey, Byron Freelon, and Yi-De Chuang about their work.

5. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

The ALS was shut down for planned installations and maintenance on 8:00 P.M. on March 31, 2003. User operations were scheduled to resume at 8:00 A.M. this morning, Wednesday, April 30, 2003.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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ALSNews Vol. 222 May 14, 2003

Contents of This Issue:

1. USER SUPPORT BUILDING PASSES CD-0 MILESTONE

(Contact: B_Feinberg@lbl.gov)

A proposed User Support Building (USB), to be strategically located next to the ALS, has passed the Department of Energy (DOE) milestone called Critical Decision 0 (CD-0), Approval of Mission Need. This authorizes the project to proceed to the conceptual design phase and request project engineering and design funding. Construction of the USB would involve the demolition of Building 10, a failing World War II - era building on the southwest side of the ALS, with a new building twice its size. The USB would include a high bay for the assembly of experimental apparatus; a seminar room; modern analytical laboratories; and office space for about 135 occupants and support for over 2,000 scientific facility users. The USB, in addition to supporting ALS users, would support users of several major research facilities located at Berkeley Lab, including the Center for Electron Microscopy (NCEM) and the Molecular Foundry. ALS management and the Users' Executive Committee (UEC) will be working to plan the details of the building.

2. NEW BEAMLINE DELIVERS COHERENT SOFT X RAYS

(Contacts: ZHussain@lbl.gov, attwood@eecs.berkeley.edu)

A ribbon-cutting ceremony was held on April 22 for Beamline 12.0.2, the new "Coherent Soft X-Ray Science Beamline." Lab Director Charles Shank, ALS Division Director Daniel Chemla, and ALS Scientific Support Group Leader Zahid Hussain were on hand for the dedication. The new beamline is a joint project of the ALS, Berkeley Lab's Center for X-Ray Optics (CXRO), and the University of Oregon. At Beamline 12.0.2, an 8-cm-undulator beamline provides photons of energies from 200 eV to 1 keV. The monochromator consists of a variable-line-spacing grating and an exit slit, enabling a bandwidth of 0.1%. There are two branch lines, one for coherent soft x-ray scattering experiments (8x demagnification, optimized for 800 eV) and the other for coherent soft x-ray optics experiments (14x demagnification, optimized for 500 eV). Steve Kevan (Univ. of Oregon) leads the coherent soft x-ray scattering experiments with the assistance of ALS postdoc Karine Chesnel and student Josh Turner (Univ. of Oregon). Graduate student Kristine Rosfjord (Univ. of California, Berkeley, and Berkeley Lab) and Paul Denham and Drew Kemp (both of CXRO) have recently completed pinhole spatial filtering experiments that clearly demonstrate the production of microwatts of tunable coherent soft x-rays, sufficient to do a wide range of experiments. Support for beamline construction was provided through the ALS and CXRO by the DOE's Office of Basic Energy Sciences, and through Director Shank by the Univ. of California.

3. ALS AWARDS AND HONORS: DOUDNA, LANZARA

The ALS is pleased to acknowledge and congratulate those in its orbit whose achievements have been recognized through awards and honors.

ALS UEC Chair Jennifer Doudna (Univ. of California, Berkeley, and Berkeley Lab) has been elected a Fellow of the American Academy of Arts and Sciences. She will be inducted at an annual ceremony at the academy's headquarters in Cambridge, Massachusetts, in October. Founded in 1780, the American Academy of Arts and Sciences is an international learned society composed of the world's leading scientists, scholars, artists, business people, and public leaders. Among the 2003 class of 187 Fellows and 20 Foreign Honorary Members are four college presidents, three Nobel Prize winners, and four Pulitzer Prize winners. "Election to the American Academy is an honor that acknowledges the best of all scholarly fields and professions. Newly elected Fellows are selected through a highly competitive process that recognizes those who have made preeminent contributions to their disciplines," said Academy President Patricia Meyer Spacks. (See http://www.amacad.org/news/new2003.htm for additional information.)

ALS user Alessandra Lanzara (Univ. of California, Berkeley, and Berkeley Lab) has been selected to receive the 2003 William L. McMillan Award "for her discovery of a universal energy scale in the nodal quasi-particle spectrum of the cuprate superconductors" due to the coupling of quasiparticles to phonons. The McMillan award honors the memory of a noted physicist at the University of Illinois at Urbana-Champaign and is presented annually to a young condensed matter physicist for distinguished research performed within five years of receiving the Ph.D. degree. Originally from Rome, Italy, Alessandra received her Ph.D. in physics from the Univ. of Rome "La Sapienza" in 1998. Working at Beamline 10.0.1, Alessandra was first author of a paper that identified a "kink" in the energy spectrum of low-energy electrons in three different families of copper oxide high-temperature superconductors. This spectral kink is the signature of an interaction between an electron and a phonon. Electron-phonon coupling drives the low-temperature superconductivity of metal alloys but its role in the cuprates remains to be proven. (See http://www-als.lbl.gov/als/science/sci_archive/48lattice_vibration.html for additional information.)

4. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Jennifer Doudna
(Contact: doudna@uclink.berkeley.edu)

The ALS UEC has selected Dennis Lindle as our Vice Chair for 2003. Dennis is a long-time user of the ALS based at the University of Nevada, Las Vegas.

Last month, representatives from the UEC committees of the four DOE-funded synchrotrons--ALS, APS, NSLS, and SSRL--met in Washington, D.C., to lobby congressional reps about the need for continued strong financial support. Greg Denbeaux (Berkeley Lab, CXRO) attended, and he reports that the trip was both educational and productive. In general, the reception from everyone was very positive, indicating that these visits are indeed beneficial. While most were sympathetic at the outset, putting faces and success stories to the mission of the light sources and the DOE Office of Science is helpful in keeping us on their agendas. It can be especially beneficial for users from particular states to meet with their congressional representatives to raise awareness of the importance of synchrotron-based research. This time, user Dr. Martin Caffrey from Ohio State University met with Rep. David Hobson (R-OH), Chair of the Energy and Water Subcommittee of the House Appropriations Committee, to explain how user facilities operate and why they are important to the academic and industrial communities. Any ALS users who want to be involved in such efforts in the future should contact one of the ALS UEC members.

Users are reminded that the 2003 ALS Users' Meeting is planned for October 6 - 8, and this year's theme, on the tenth anniversary of the ALS, is "Looking ahead: the next ten years at the ALS." Meeting co-organizers Eli Rotenberg (ERotenberg@lbl.gov) and Gerry McDermott

(GMcDermott@lbl.gov) are planning an exciting series of talks and workshops to highlight recent research as well as future directions at the ALS. Please forward your ideas for workshop topics or discussion leaders to Eli and Gerry, and plan to attend!

5. REMINDER: GENERAL SCIENCES PROPOSALS DUE JUNE 1

(Contact: alsproposals@lbl.gov)

The User Services Office is still accepting general user proposals from scientists who wish to conduct research in the general sciences at the ALS during the running period from December 2003 to May 2004. The deadline for submissions is June 1, 2003. (This deadline does not apply to protein crystallography proposals, which have a separate process and schedule.) Scientists wishing to renew a previous proposal must download the one-page "ALS Experiment Report and Request for Beamtime" form (see links below) and submit it to the User Services Office by the June 1 deadline. Proposals cannot be renewed for more than three cycles after they are first submitted. The following resources are available for further information:

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alsuser@lbl.gov

General user proposal process
http://www-als.lbl.gov/als/quickguide/independinvest.html

ALS General Sciences Proposal and Request for Beamtime
http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/Page1P.shtml/Initialize

ALS Experiment Report and Request for Beamtime (renewal form)
http://www-als.lbl.gov/als/quickguide/expt_report.rtf

Beamline information
http://www-als.lbl.gov/als/als_users_bl/datasheets.html
http://www-als.lbl.gov/als/als_users_bl/bl_table.html

Proposal Study Panel (PSP) scores
http://www-als.lbl.gov/als/quickguide/pspscores.html

6. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
John Bradley (Lawrence Livermore National Laboratory)
Thomas Borch (Montana State Univ.)
Ben Gilbert (Univ. of California, Berkeley)
Raymond Jeanloz (Univ. of California, Berkeley)

Beamlines 5.0.1, 5.0.2, 5.0.3
Barry Stoddard (Fred Hutchinson Cancer Research Center)
Xiayang Qiu (Pfizer Global Research and Development)
Kevin D'Amico (Structural Genomix)
Kai Lin (Univ. of Massachusetts)
Marc Jacobs (Vertex Pharmaceuticals)

Marc Whitlow (Berlex Biosciences)
Nigel Walker (Tularik, Inc.)
Partho Ghosh (Univ. of California, San Diego)
Marc Knapp (Roche Bioscience)
Elizabeth Getzoff (Research Institute of Scripps Clinic)
Glen Spraggon (Novartis Institute for Functional Genomics)
Duncan Mcree (Syrrx, Inc.)
David McKay (Stanford Univ.)

Beamline 6.3.1
Maurizio Sacchi (Univ. Paris-Sud, France)
Steve Kevan (Univ. of Oregon)

Beamline 7.3.1.1
Kai Starke (Freie Univ. Berlin, Germany)
Sergiy Minko, Denys Usov (Institut fur Polymerforschung Dresden, Germany)

Beamline 7.3.3
John Bargar (Stanford Synchrotron Radiation Laboratory)
Alain Manceau (Univ. Joseph Fourier, France)

Beamline 8.0.1
Manfred Neumann (Univ. of Osnabrueck, Germany)
Kevin Prince (Sincrotrone Trieste, Italy)
Satish Myneni (Princeton Univ.)

Beamlines 8.2.1, 8.2.2
Axel Brunger (Stanford Univ.)
Kenan Garcia (Stanford Univ.)
Jennifer Doudna (Univ. of California, Berkeley, Berkeley Lab)
Wim Hol (Univ. of Washington)
John Kuriyan (Univ. of California, Berkeley)
Duilio Cascio (Univ. of California, Los Angeles)
Ashley Deacon (Stanford Linear Accelerator Center/Joint Center for Structural Genomics)

Beamline 9.0.2
Wei Kong (Oregon State Univ.)
Cheuk-Yiu Ng (Univ. of California, Davis)
Larry Sorenson (Univ. of Washington)
Ricardo Metz (Univ. of Massachusetts)

Beamline 9.3.2
Christine Richter (Universite de Cergy-Pontoise, France)
Allen Johnson (Univ. of Nevada, Las Vegas)

Beamline 10.0.1
Duane Jaecks (Univ. of Nebraska-Lincoln)

Beamline 10.3.1
Britt Holmen (Univ. of Connecticut)

7. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user runs of April 30 - May 5 and May 6 - 11, the beam reliability (time delivered/time scheduled) was 95%. Of the scheduled beam, 85% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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LBNL/PUB-875
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

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ALSNews Vol. 223 May 28, 2003

Contents of This Issue:

1. CLUES TO CHOLESTEROL REGULATION FOUND IN LDLR STRUCTURE

by Lori Tamura
(Contact: rudenko@chop.swmed.edu)

Cholesterol, especially in the "bad" form attached to low-density lipoprotein (LDL) particles, has been maligned as the culprit behind increased risk of atherosclerosis and heart disease. The truth, however, is that cholesterol is an essential component of cell membranes and provides the raw material for the synthesis of hormones, including estrogen and testosterone. A healthy level of cholesterol is regulated in part by a protein called the LDL receptor (LDLR). Anchored to the cell surface, LDLR captures LDL particles from the bloodstream and draws them inside the cell, where a shift to more acidic pH triggers LDL release. A highly decorated team of researchers, including three Nobel laureates, examined the structure of LDLR at protein crystallography beamlines at the ALS and the Advanced Photon Source (APS). The LDLR crystals, painstakingly prepared to reflect the conditions for LDL release within the cell (pH less than 6), yielded the structure of a key portion of LDLR, providing clues as to how the LDL release mechanism works. Such "working" knowledge is essential to understanding how breakdowns in the system lead to cholesterol-related disease.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/56ldlr_structure.html.

Publication about this research: G. Rudenko, L. Henry, K. Henderson, K. Ichtchenko, M.S. Brown, J.L. Goldstein, and J. Deisenhofer, "Structure of the LDL Receptor Extracellular Domain at Endosomal pH," Science 298, 2353 (2002).

2. SRI 2003 EARLY REGISTRATION DEADLINE JUNE 3

(Contact: sri03@lbl.gov)

The early registration deadline for the Eighth International Conference on Synchrotron Radiation Instrumentation (SRI 2003) is fast approaching! The conference, to be held August 25-29 at Yerba Buena Center for the Arts in downtown San Francisco, will cover a wide range of topics, including new developments in synchrotron radiation sources, free electron lasers, beamline instrumentation, and experimental techniques. Anyone planning to attend the conference should register online at http://www.sri2003.lbl.gov/html/registration.html by June 3 to receive the early registration rate of $450.00 (regular). After that date, the registration fee rises to $525.00. The student fee is $300.00.

It is also a good time to think about making reservations at conference hotels. Accommodations have been reserved at nearby hotels at reduced conference rates, and meeting attendees are urged to reserve as soon as their travel plans are complete to ensure the discounted rate.

The main SRI 2003 Web page at http://www.sri2003.lbl.gov/ has additional information, including a description of the meeting site; a preliminary program; online registration; accommodation, travel, and visa tips; tourist links; and a companion sightseeing program.

3. ART SHOW DRAWS A CROWD

(Contact: EJMoxon@lbl.gov)

ALS staff and users were treated to a unique event on May 15 when students from the University of California, Berkeley (UCB), displayed their artistic impressions of the ALS on the outdoor patio. The students, from the art, architecture, and engineering departments on campus, had recently spent two evenings at the ALS painting and drawing at various locations around the experiment floor. The result of their efforts was a colorful array of images of everything from wiring and monochromators to the historic ALS dome. For ALS staff it was a rare opportunity to see their environment through the fresh eyes of artists, and for the students it was an intriguing glimpse into the big research facility up on the hill. Liz Moxon (ALS) and David Attwood (Applied Science and Technology Program, UCB) organized the event with Professor Joe Slusky of UCB's Department of Architecture.

The images will also be exhibited during the SRI 2003 conference at Yerba Buena Center for the Arts in San Francisco.

4. LAST CALL: GENERAL SCIENCES PROPOSALS DUE JUNE 1

(Contact: alsproposals@lbl.gov)

June 1, 2003, is the deadline for general user proposals in the general sciences for the running period from December 2003 to May 2004. (This deadline does not apply to protein crystallography proposals, which have a separate process and schedule.)

Scientists wishing to renew a previous proposal must download the one-page "ALS Experiment Report and Request for Beamtime" form (see links below) and submit it to the User Services Office by the June 1 deadline. The numeric rating for each proposal will be communicated to the user along with comments from the Proposal Study Panel, where appropriate. The cutoff rating for each beamline in the previous proposal cycle is published on the Web (see below). The following resources are available for further information:

ALS User Services Administrator
alsuser@lbl.gov

General user proposal process
http://www-als.lbl.gov/als/quickguide/independinvest.html

ALS General Sciences Proposal and Request for Beamtime
http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/Page1P.shtml/Initialize

ALS Experiment Report and Request for Beamtime (renewal form)
http://www-als.lbl.gov/als/quickguide/expt_report.rtf

Beamline information
http://www-als.lbl.gov/als/als_users_bl/datasheets.html
http://www-als.lbl.gov/als/als_users_bl/bl_table.html

Proposal Study Panel (PSP) scores

http://www-als.lbl.gov/als/quickguide/pspscores.html

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Gordon Brown (Stanford Univ.)
Raymond Jeanloz (Univ. of California, Berkeley)
Hoi-Ying Holman (Berkeley Lab)
John Bradley (Lawrence Livermore National Laboratory)

Beamlines 5.0.1, 5.0.2, 5.0.3
Ed Berry (Berkeley Lab)
Peter Hwang (Univ. of California, San Francisco)
Sung-Hou Kim (Berkeley Lab)
Nigel Walker (Tularik, Inc.)
William Somers (Wyeth-Ayerst Research)
Marc Jacobs (Vertex Pharmaceuticals)
Ian Wilson (The Scripps Research Institute)
P. Andrew Karplus (Oregon State Univ.)
Mark Knapp (Roche Bioscience)
Duncan McRee (Syrrx, Inc.)
Glen Spraggon (Novartis Institute for Functional Genomics)

Beamline 5.3.2
Stephen Urquhart (Univ. of Saskatchewan, Canada)
Gary Mitchell (The Dow Chemical Company)
Adam Hitchcock (McMaster Univ., Canada)
Harald Ade (North Carolina State Univ.)

Beamline 6.3.1
Steve Kevan (Univ. of Oregon)

Beamline 7.3.1.1
Sergiy Minko, Denys Usov (Institut fur Polymerforschung Dresden, Germany)

Beamline 7.3.3
Ersan Ustundag (California Institute of Technology)

Beamlines 8.2.1, 8.2.2
Ursula Schulze-Gahmen (Berkeley Lab)
Ashley Deacon (Stanford Synchrotron Radiation Laboratory)
Clare Peters-Libeu (Univ. of California, San Francisco)
Roger Kornberg (Stanford Univ.)
Joseph Mougous (Univ. of California, Berkeley)

Beamline 8.3.1
Sabine Borngraeber, Maia Vinogradova, Julian Chen, Joel Credle, Eugene Hur, Dennis Wang, Hu Pan (Univ. of California, San Francisco)
Al Stewart (SUGEN, Inc.)

Beamline 10.0.1
Ron Phaneuf (Univ. of Nevada, Reno)

Beamline 10.3.1
Eleanor Blakeley (Berkeley Lab)

6. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user runs of May 14 - 19 and May 20 - 24, the beam reliability (time delivered/time scheduled) was 95%. Of the scheduled beam, 91% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

LBNL/PUB-875
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov, ejmoxon@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 224 June 11, 2003

Contents of This Issue:

1. COHERENT TERAHERTZ SYNCHROTRON RADIATION

by Art Robinson
(Contact: JMByrd@lbl.gov)

When the wavelength of synchrotron radiation is comparable to the length of an electron bunch in the storage ring, or the length of any structure on the bunch, the radiation from multiple electrons is in phase, resulting in a quadratic rather than the usual linear dependence of the power emitted on the number of electrons. Because the number of electrons participating in the coherence can be large (more than 1 million), the potential power enhancement is very large, making coherent synchrotron radiation (CSR) a subject of great interest to both synchrotron users and accelerator designers. However, the electromagnetic field associated with CSR can influence the motion of the electrons in the bunch, resulting in a self-amplified instability. This instability increases the electron bunch length and energy spread and represents a fundamental limitation on the performance of an electron storage ring. A joint Advanced Light Source/Berkeley Lab/University of California, Davis, team has now been able to observe and, for the first time, explain this instability.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/61coherent.html.

Publication about this research: J.M. Byrd, W. Leemans, A. Loftsdottir, B. Marcelis, M.C. Martin, W.R. McKinney, F. Sannibale, T. Scarvie, and C. Steier, "Observation of broadband self-amplified spontaneous coherent terahertz synchrotron radiation in a storage ring," Phys. Rev. Lett. 89, 224801 (2002).

2. ALS ACHIEVES LOWEST VERTICAL EMITTANCE IN A STORAGE RING

(Contact: CSteier@lbl.gov)

Emittance is one of the key parameters that describe a particle beam circulating in a storage ring. Defined as the product of the beam size and beam divergence in the respective directions, there are both horizontal and vertical emittances. Decreasing the storage ring's vertical emittance results in a higher brightness in synchrotron light sources and a higher luminosity in particle colliders. Through careful analysis and characterization of the storage ring, ALS accelerator scientists have reduced the ALS vertical emittance to 5 picometer-radians during accelerator physics studies. This is the lowest emittance value ever realized in any storage ring.

In the vertical plane, the emittance is determined by magnetic and alignment imperfections in the storage ring. To compensate for these imperfections, the scientists adjusted the power supplies of 18 skew quadrupoles--magnets intentionally tilted by 45 degrees around the longitudinal axis and used for coupling control and vertical dispersion correction. The resulting vertical emittance, less

than 0.1% of the horizontal emittance, corresponds to a vertical beam size of about 5 microns in the straight sections of the storage ring, where the undulators that produce the brightest synchrotron radiation are located. This emittance is a factor of 25 to 30 lower than the emittance during ALS user operations and about a factor of 2 smaller than the best values achieved in earlier studies at other storage rings around the world, such as ESRF in France, SLS in Switzerland, and Spring-8 and ATF in Japan. Such low emittances meet the values required for the next generation of linear collider damping rings, and at the ALS, very small vertical emittances will be especially important for those spectroscopy studies in which the highest possible resolution is important.

3. SYMPOSIUM PAYS TRIBUTE TO IRAN THOMAS

(Contact: GFKrebs@lbl.gov)

ALS Division Director Daniel Chemla was among those paying tribute to the late Iran Thomas of the Department of Energy's Office of Science at a special symposium held May 28-29. "BES Science 2018: A Future Retrospective" was held at the Sheraton National Hotel in Arlington, Virginia, in honor of Thomas, a long-time director in the Office of Basic Energy Sciences (BES) who passed away on February 28. During his tenure, Thomas enabled the development of new and innovative research programs and some of the world's most powerful scientific user facilities, including the ALS. Speakers were asked to place themselves in the year 2018, the year of Iran's 80th birthday, 15 years into the future. In providing a "retrospective" of the years from 2003 to 2018, the speakers were to challenge both the scientific communities and the federal agencies to set a course to achieve this future.

The symposium began with an exhibit of posters and displays of BES-supported Nobel Prizes and BES user facilities. The ALS contributed a poster showing the progress of science at the ALS from the past and into the future. The poster session was followed by a dinner during which national user facility directors reminisced about Iran Thomas. The following day, the talks began with a welcome by Pat Dehmer, Director of BES. The morning session, "BES Science," was chaired by Berkeley Lab Director Charles Shank, and ALS Division Director Daniel Chemla was the first speaker of the morning with a talk titled "Enabling BES Science: A retrospective on the growth of BES science in materials sciences, chemistry, and biosciences." The talk extrapolated from active research areas with significant advances in which BES and BES facilities played a critical role: the high-Tc superconductivity saga; carbon nanotubes and cohort; bio-materials, -machines, and -systems; and quantum coherence and macroscopic ordering in condensed matter. The full program and several of the presentations and remarks are available online at http://www.ornl.gov/%7Egrg/BES_sym/.

4. BE A PART OF THE ALS 10TH ANNIVERSARY CELEBRATIONS IN OCTOBER

(Contact: als10years@lbl.gov)

Do you have stories about the early years of the ALS, or historical insights (and hindsights) about its construction? Or were you there when the first light shone through a beamline? If you have a story to tell or a photo to show, let us know at als10years@lbl.gov.

We would also like to hear from anyone who would like to participate in helping to plan the celebration. Send in your suggestions and contact information to als10years@lbl.gov.

5. NEW USER ADVISORIES ISSUED

(Contact: EJMoxon@lbl.gov)

Two new ALS User Advisories have recently been posted to the ALS Web site at http://www-als.lbl.gov/als/user-advis/. Advisories are short information sheets that provide safety guidelines and

procedures, equipment specifications, and contact information for a variety of issues concerning ALS users. The new advisories are the following:

ALS User Advisory No. 17: Electrical Safety During Beamline Bakeouts. Details the procedures and proper equipment required for safely baking out vacuum vessels before they are used at the ALS.

ALS User Advisory No. 18: The Use of Biological Materials at the ALS. Provides a step-by-step guide for users intending to use biological materials (biologicals) in experiments at the ALS. All biologicals must be registered and approved by Berkeley Lab's Institutional Biosafety Committee and the ALS before they may be brought to the ALS. Included in the advisory are instructions for registering materials; guidelines for the proper shipping, storage, and handling of biologicals; and links to Berkeley Lab's Biosafety Manual and to the Biosafety Registration Form.

6. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Raymond Jeanloz (Univ. of California, Berkeley)
John Bradley (Lawrence Livermore National Laboratory)
T.J. Wilkinson (Berkeley Lab)
Ted Raab (Carnegie Institution of Washington)
Hoi-Ying Holman (Berkeley Lab)

Beamline 4.0.2
Chuck Fadley (Univ. of California, Davis, and Berkeley Lab)
Steve Cramer (Univ. of California, Davis, and Berkeley Lab)

Beamlines 5.0.1, 5.0.2, 5.0.3
Thomas Poulos (Univ. of California, Irvine)
Mark Knapp (Roche Bioscience)
Steven Jordan (Amgen)
Ed Berry (Berkeley Lab)
Barry Stoddard (Fred Hutchinson Cancer Research Center)
David Christianson (Univ. of Pennsylvania)
Marc Whitlow (Berlex Biosciences)
Ian Wilson (The Scripps Research Institute)
Glen Spraggon (Novartis Institute for Functional Genomics)
Ning Zheng (Univ. of Washington)
Richard Brennan (Oregon Health & Science University)
Duncan McRee (Syrrx, Inc.)

Beamline 7.0.1
Z.Q. Qiu (Univ. of California, Berkeley)
Byron Freelon (Berkeley Lab)
Miquel Salmeron (Berkeley Lab)

Beamline 7.3.1.1
Jo Stohr (Stanford Synchrotron Radiation Laboratory)
Hiroo Hashizume (Nara Institute of Science and Technology, Japan)
Geoffrey Thornton (Manchester Univ., UK)

Beamline 8.0.1
Thomas Callcott (Univ. of Tennessee)

Beamlines 8.2.1, 8.2.2, 8.3.1
Kenan Garcia (Stanford Univ.)
Jennifer Doudna (Univ. of California, Berkeley, and Berkeley Lab)
Axel Brunger (Stanford Univ.)
John Kuriyan (Univ. of California, Berkeley, and Berkeley Lab)
Pamela Bjorkman (California Institute of Technology)
Joseph Mougous (Univ. of California, Berkeley)

Beamline 10.0.1
Fred Schlachter (Berkeley Lab)
Z.-X. Shen (Stanford Univ.)
Nora Berrah (Western Michigan Univ.)

Beamline 10.3.2
Peter Nico (California State Univ., Stanislaus)
Hoi-Ying Holman (Berkeley Lab)

7. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user run of May 29 - June 1, the beam reliability (time delivered/time scheduled) was 85%. Of the scheduled beam, 77% was delivered to completion without interruption. Repair of a water-flow switch requiring controlled access, tuning problems, and chicane magnet control problems contributed to loss of beam during this short run.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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LBNL/PUB-875
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov, ejmoxon@lbl.gov

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ALSNews Vol. 225 June 25, 2003

Contents of This Issue:

1. HIGH-QUALITY X-RAY SCATTERING DATA FOR WATER

by Art Robinson
(Contact: TLHead-Gordon@lbl.gov)

Given the importance of water, it is no surprise that determining the geometrical structure of this life-giving liquid has a long history. In principle, an accurate characterization of the structure of liquid water can be obtained from x-ray and neutron scattering experiments. However, the inconsistency in the experimental results over the past 30 years means that an accurate measurement of water structure is still needed. A group from the University of California, Berkeley, and Berkeley Lab has now reported improved x-ray scattering data taken at the ALS for pure water over the biologically relevant temperature range of 2 to 77 degrees Celsius. Not only are the new data of higher quality than in the past, but the x-ray scattering intensities are qualitatively different.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/63water.html.

Publications about this research: G. Hura, D. Russo, R.M. Glaeser, T. Head-Gordon, M. Krack, and M. Parrinello, "Water structure as a function of temperature from x-ray scattering experiments and ab initio molecular dynamics," Phys. Chem. Chem. Phys. (PCCP) 5, 1981 (2003) and T. Head-Gordon and G. Hura, "Water structure from scattering experiments and simulation," Chem. Rev. 102, 2651 (2002).

2. ALS AND SSRL STAFF MEET TO COORDINATE EFFORTS

(Contact: ZHussain@lbl.gov)

Continued communication and cooperation were goals of the third annual coordination meeting, held on June 11, between representatives of the ALS and the Stanford Synchrotron Radiation Laboratory (SSRL). Since 2001, the two West-Coast light sources have been committed to working together and keeping the lines of communication open through high-level meetings held annually at alternating sites. This year's meeting was held at SSRL, and agenda items included the coordination of strategic plans; research and development projects; demonstration experiments for future facilities (e.g., Sub-Picosecond Pulse Source, slicing source); the timing of shutdowns (including accommodating users during SSRL's SPEAR upgrade shutdown); coordination of users' meetings, workshops, and conferences (such as SRI 2003); and various other opportunities for sharing lessons learned and avoiding duplication of effort. Specific R&D projects addressed were high-speed (GHz) detectors, advanced (superconducting, small-gap) insertion devices, electron gun improvements, x-ray compression, and beamline and endstation development. Participants also discussed ideas for a common, easily understood metric to be used by light sources for evaluating a facility's current capabilities against its full future potential. After the meeting, the ALS visitors were given a tour of the recently completed, 112-room Stanford Linear Accelerator Center Guest House.

ALS participants included Daniel Chemla, Neville Smith, Ben Feinberg, Zahid Hussain, Gary Krebs, David Robin, John Corlett, Peter Denes, Phil Heimann, Steve Marks, and Thomas Earnest. SSRL representatives included Keith Hodgson, Jo Stohr, Herman Winick, Jerry Hastings, Gordon Brown, Anders Nilsson, Piero Pianetta, Britt Hedman, and John Galayda.

3. APPROVED PROGRAM POLICY: LETTERS OF INTEREST
(Contact: NVSmith@lbl.gov)

An Approved Program (AP) policy has been devised jointly by ALS management, the Science Advisory Committee, the Users' Executive Committee, and the general sciences Proposal Study Panel (PSP). AP status enables an investigator or group of investigators to receive an assured percentage of beamtime for a period of a few years to carry out an extended program of research. The process for acquiring AP status begins with the submission of a short letter of interest by a principal investigator through the User Services Office for consideration by the PSP. The next meeting of the general sciences PSP will be on July 18, 2003. Letters of interest received by July 11 will be forwarded to them for their consideration. As AP time slots become available, the PSP will solicit full proposals from investigators either self-identified through letters of interest or nominated by the PSP itself as well as from AP investigators coming up for renewal. For more detailed information on the AP policy and procedure, go to http://www-als.lbl.gov/als/uec/UserPolicy.html.

4. ALS MAKES ITS DEBUT ON SILVER SCREEN

Standing in for the "Berkeley Nuclear Biotechnology Institute," the ALS made its big-screen debut last weekend as the birthplace of "The Hulk," the latest comic-book character to come to life at the movies. Director Ang Lee and cast members Eric Bana, Jennifer Connelly, and Nick Nolte were on site last year to film the ALS location scenes, including several shots of the ALS patio, lobby, and mezzanine offices as well as a few panoramas of San Francisco Bay. A special return trip was made this past April to film Hulk creator Stan Lee and TV Hulk Lou Ferrigno walking out of the ALS lobby in cameo roles as security guards. In one climactic scene, the Hulk rips the Gammasphere (a real-life gamma detector portrayed in the movie as a gamma source) from its connections and hurls it through the wall of the ALS. Anyone who has ever felt frustrated by a piece of equipment may be able to relate.

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

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Hoi-Ying Holman (Berkeley Lab)

Beamline 4.0.2
Jo Stohr (Stanford Synchrotron Radiation Laboratory)

Beamlines 5.0.1, 5.0.2, 5.0.3
Peter Hwang (Univ. of California, San Francisco)
Marc Jacobs (Vertex Pharmaceuticals)
Richard Brennan (Oregon Health & Science University)
Xiayang Qiu (Pfizer Global Research and Development)
Russell Doolittle (Univ. of California, San Diego)
Ian Wilson (The Scripps Research Institute)

William Somers (Wyeth-Ayerst Research)
Tina Izard (St. Jude Children's Research Hospital)
Ed Berry (Berkeley Lab)
Nigel Walker (Tularik, Inc.)
Glen Spraggon (Novartis Institute for Functional Genomics)

Beamline 5.3.2
Harald Ade (North Carolina State Univ.)
Gary Mitchell (The Dow Chemical Company)
Adam Hitchcock (McMaster Univ., Canada)

Beamline 7.0.1
Steve Kevan (Univ. of Oregon)
Jim Tobin (Lawrence Livermore National Laboratory)

Beamline 7.3.1.1
Geoffrey Thornton (Manchester Univ., UK)

Beamlines 8.2.1, 8.2.2
Jennifer Doudna (Univ. of California, Berkeley, and Berkeley Lab)
Axel Brunger (Stanford Univ.)
Stephen Lippard (Massachusetts Instititue of Technology)
Wim Hol (Univ. of Washington)
Christopher Garcia (Stanford Univ.)
Elizabeth Getzoff (Research Institute of Scripps Clinic)

Beamline 9.3.2
Artur Braun (Univ. of Kentucky)

Beamline 10.0.1
Dan Dessau (Univ. of Colorado at Boulder)
Nora Berrah (Western Michigan Univ.)

Beamline 10.3.2
Donald Sparks (Univ. of Delaware)

6. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of June 3 - 8, 10 - 15, and 18 - 23, the beam reliability (time delivered/time scheduled) was 99%. Of the scheduled beam, 94% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

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ALSNews Vol. 226 July 9, 2003

Contents of This Issue:

1. ALS DIRECTOR REPORTS ON STATE OF THE ALS

In a presentation to ALS staff on June 25, ALS Director Daniel Chemla looked back on the accomplishments of the past year and forward to short- and long-term developments designed to keep the ALS at the cutting edge of third-generation light sources for the next two to three decades. In general, Daniel noted that the ALS has experienced possibly the fastest growth ever by a light source, with 21 new beamlines added in the last four years. The number of ALS users has surpassed 1400 and is projected to reach 1700 by the end of this fiscal year (FY 03). In its 10 years of operation, the ALS has accumulated about $92 M worth of equipment around the machine, of which 41% was from non-Department of Energy (DOE) sources. All this growth, plus a lot of outstanding science and the development of major new initiatives, has made it, according to Daniel, "an amazing year."

Read the full story at
http://www-als.lbl.gov/als/als_news/news_archive/vol.226_070903.html#1.

Daniel reported that the Molecular Environmental Sciences beamline was completed last fall, and a coherent soft x-ray scattering beamline came online in April. A proposal for an ultrahigh-resolution spectroscopy facility was submitted to the DOE and was recently approved for $2.4 M (FY 03) and $1.1 M (FY 04). PEEM-3 is making good progress, with completion projected to be a year away. Work on a femtosecond slicing source will continue as a research program for the next two years. Development of a GHz-rate detector, 100 to 1000 times faster than present detectors, is well under way, with a full test in the Scienta analyzer at Beamline 4.0.2 scheduled for this summer. Four superbend beamlines are currently under construction (two for protein crystallography and one each for tomography and high-pressure science), leaving five superbend beamlines still available.

All straight sections have been allocated; possible ways to move forward include, as part of an overall upgrade to the ALS, replacing several 4.5-m insertion devices with 2-m insertion devices in chicane arrangements and adding four new beamlines optimized for specific applications. The proposed upgrade would also involve changing the injection and rf systems to accommodate the switch to a "top-up" mode of continuous electron injection. Because the ALS was very well designed, it can be upgraded without major changes to the structure of the machine in two short (six-week) shutdowns. Such an upgrade would result in an increase in brightness of up to two orders of magnitude at a modest cost.

The ALS upgrade proposal was presented to the DOE this year along with proposals for CIRCE, a coherent far-infrared ring, and LUX, a linac-based ultrafast x-ray source (see ALSNews Vol. 217). In response to the upgrade proposal, the DOE requested specifics on how much could be accomplished with various funding levels, information which the ALS has provided. For CIRCE and LUX, the recommendation of the DOE advisory panel was to further gauge national interest in

these facilities through "facility neutral" workshops, which are currently being scheduled for the fall and spring, respectively.

Daniel also spent some time describing several examples of outstanding science done at the ALS in the past year. A time-resolved PEEM experiment involving stroboscopic pump-probe measurements produced a "movie" of the motion of magnetic vortices. A study of an "exotic" material--a material subject to extreme temperatures and pressures in a very brief pulse--illustrated the need for time-resolved nanometer-length probes to explore transient chemical species and particle-formation mechanisms. The structure of a membrane protein that recognizes toxins and "spits" them out provided valuable insight into how bacteria develop drug resistance. Finally, Daniel reported on a remarkable demonstration of "lensless" two-dimensional imaging using coherent x-ray diffraction. Daniel closed the presentation by reminding the audience that this year's Users' Meeting will be held October 6 - 8, celebrating the ALS's 10th anniversary of operation; he then thanked all ALS staff members for a terrific year.

2. EUV LITHOGRAPHY PROJECT WINS R&D 100 AWARD

(Contact: attwood@eecs.berkeley.edu)

A technology (developed in part at the ALS) that uses extreme ultraviolet (EUV) light to enable the continued miniaturization of microchips has been recognized with an R&D 100 Award for 2003 from R&D Magazine. Called the "Oscars of Invention," the awards honor the 100 most technologically significant new products of the year. The photolithography techniques that have miniaturized electronics and made today's laptop computers as powerful as a roomful of 1970s-era mainframes will soon reach their natural limit. Printing smaller chip features will require EUV light, whose wavelength is too short to focus with ordinary lenses.

To meet this challenge, Berkeley Lab scientists joined with scientists from Lawrence Livermore and Sandia National Laboratories to form a DOE Virtual National Laboratory. Together they devised and tested a chip-printing "stepper" that uses coated mirrors instead of lenses to bend and focus light. Contributing to the success of this project were teams working at three beamlines at the ALS, under the auspices of Berkeley Lab's Center for X-Ray Optics. At Beamline 6.3.2, work focused on measuring the reflectivity and uniformity of multilayered molybdenum-silicon coatings, which are central to the EUV lithography process. Beamline 11.3.2 was dedicated to finding tiny defects in lithography masks. Finally, because EUV lithography places extremely high demands on the fabrication of EUV mirror substrates and multilayer coatings, the interferometer at Beamline 12.0.1, touted as the most accurate wavefront-measuring device in the world, was indispensable for characterizing and predicting the performance of the precision optics critical to EUV lithography.

In 2001, the first full-scale prototype demonstrated the possibility of making microprocessors with 10 times as many transistors and memory chips as today's best, operating 10 times as fast and storing 40 times as much information. In 2002, Intel Corporation placed an order for the first production-model stepper. The Virtual National Laboratory worked closely with representatives of an industry consortium whose members include Intel, Motorola, Advanced Micro Devices, Infineon, IBM, and Micron.

3. WARNING: EXPECT TIGHTER SECURITY BEGINNING IN AUGUST

(Contact: JPTroutman@lbl.gov)

Berkeley Lab is under ever-increasing pressure from the DOE to improve its security measures. At the end of August 2003, gate security guards will be refusing entry to anyone who does not have either a valid badge or a gate pass. Therefore, the importance of communicating with the ALS User

Services Office before you first arrive as a new user or when your badge has expired cannot be stressed enough.

Before arriving, new users without a badge must preregister via the ALS web site at http://www-als.lbl.gov/als/quickguide/registration.html. They must also notify the ALS User Services Office (at alsuser@lbl.gov or 510-486-7745). Users with an expired badge need only notify the User Services Office before arriving.

New users planning to arrive on a weekend, when there are fewer people available to vouch for your identity, must notify the User Services Office by 4 P.M. the preceding Friday so that the control room can be notified. Do not assume access is automatic! Otherwise, the guards at the gate will be obligated to turn you away.

Users with citizenship in a country that the United States government has designated as a state sponsor of terrorism (Iran, Iraq, Syria, Libya, Cuba, North Korea, Sudan) must notify the ALS User Services Office AT LEAST 90 days in advance.

The easiest way to communicate with the User Services Office is by sending an email to alsuser@lbl.gov or calling 510-486-7745. By following these procedures, the ALS will be able to ensure efficient access to the Lab for our users.

4. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
John Bradley (Lawrence Livermore National Laboratory)
Hoi-Ying Holman (Berkeley Lab)

Beamline 4.0.2
Stefan Maat (IBM Almaden Research Center)
Steve Cramer (Univ. of California, Davis, and Berkeley Lab)

Beamlines 5.0.1, 5.0.2, 5.0.3
Kevin Parris (Wyeth-Ayerst Research)
Dong Hae Shin, Vaheh Oganesyan, Jinyu Liu (Berkeley Lab)
Steve Holbrook, Libby Holbrook, Wasantha Ranatunga, Jana Mooseter, Claudia Kliemann (Berkeley Lab)
Alexei Kazantsev (Univ. of Colorado at Boulder)
Mark Knapp, Armando Villasenor (Roche Bioscience)
Gyorgy Snell (Syrrx, Inc.)
Thomas Poulos (Univ. of California, Irvine)
Steven Jordan (Amgen)
Marc Jacobs (Vertex Pharmaceuticals)
Li-Wei Hung (Brookhaven National Laboratory)
Manal Swairjo (The Scripps Research Institute)
Xiayang Qiu (Pfizer Global Research and Development)
Ashley Deacon (Stanford Synchrotron Radiation Laboratory)
Richard Brennan (Oregon Health & Sciences University)

Beamline 7.0.1
M. Zahid Hasan (Princeton Univ.)

Laurent Duda (Uppsala Univ., Sweden)

Beamline 7.3.1.1
Z.Q. Qiu (Univ. of California, Berkeley)
Mikhail Zharnikov (Univ. of Heidelberg, Germany)

Beamline 7.3.3
Eric Stach (Berkeley Lab)
Monica Barney (Berkeley Lab)

Beamline 8.0.1
David Ederer (Tulane Univ.)

Beamlines 8.2.1, 8.2.2
Axel Brunger (Stanford Univ.)
Christopher Garcia (Stanford Univ.)
Greg Bowman (Univ. of California, Berkeley)
Duilio Cascio (Univ. of California, Los Angeles)
Jennifer Doudna (Univ. of California, Berkeley, and Berkeley Lab)
Joseph Mougous (Univ. of California, Berkeley)

Beamline 8.3.1
Joel Credle, Earl Rutenber (Univ. of California, San Francisco)
Peter Hwang (Univ. of California, San Francisco)
Weiru Wang, Graeme Card (Plexxikon, Inc.)
Xiaomin Chen, Zhiyong Ren, Xiang Mao (Univ. of Texas)
David Akey, Jan Erzberger, Jacob Corn (Univ. of California, Berkeley)
Sibyl Baladi (Univ. of California, Berkeley)
Ho-Leung Ng (Univ. of California, Berkeley)
Peter Beernik (Lawrence Livermore National Laboratory)
Matt Good (Univeristy of California, Berkeley)
Magnar Bjoras (The Scripps Research Institute)
Eugene Hur (University of California, San Francisco)
Pan Hu (Univeristy of California, San Francisco)
Jamie Cate (Berkeley Lab)

Beamline 9.0.1
Terrill Cool (Cornell Univ.)

Beamline 9.0.2
Steve Kevan (Univ. of Oregon)

Beamline 9.3.2
Frank Ogletree (Berkeley Lab)
Phil Ross (Berkeley Lab)

Beamline 10.0.1
Duane Jaecks (Univ. of Nebraska-Lincoln)
Z.X. Shen (Stanford Univ.)

Beamline 10.3.2
Michael Kersten (Johannes Gutenberg Univ., Germany)

5. ALSNEWS ON SUMMER HIATUS

The next issue of ALSNews will be published on August 6.

6. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user run of June 24 - July 2, the beam reliability (time delivered/time scheduled) was 95%. Of the scheduled beam, 91% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

LBNL/PUB-875
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 227 August 6, 2003

Contents of This Issue:

1. ULTRAFAST XANES TECHNIQUE REVEALS PHOTOCHEMICAL TRANSIENTS

by Art Robinson
(Contacts: christian.bressler@ipmc.unil.ch, majed.chergui@ipmc.unil.ch)

Ultrafast, time-resolved x-ray experiments are on the frontier of synchrotron radiation science with several demonstrations of white-light (Laue) x-ray diffraction to track structural changes on the picosecond time scale. Comparable experiments with x-ray absorption are more challenging because data must be recorded at each photon energy over the spectral range of interest. Transient, photochemical intermediate states in solution pose the additional difficulty of a solvent whose effects must be accounted for. A team of researchers from the University of Lausanne, the Swiss Light Source, the University of California, Berkeley, and the ALS have paved the way for experiments of this type by using x-ray absorption near-edge structure spectroscopy (XANES, also known as NEXAFS) to detect the change in oxidation state of the central ruthenium atom in a laser-excited ruthenium complex in solution.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/65photochemical.html.

Publication about this research: M. Saes, C. Bressler, R. Abela, D. Grolimund, S.L. Johnson, P.A. Heimann, and M. Chergui, "Observing photochemical transients by ultrafast x-ray absorption spectroscopy," Phys. Rev. Lett. 90, 047403 (2003).

2. 2003 ALS USERS' MEETING SLATED FOR OCTOBER 6 - 8

(Contact: alsum2003@lbl.gov)

The annual ALS Users' Meeting will be held at Berkeley Lab from Monday, October 6, through Wednesday, October 8, 2003. Along with the regular complement of keynote speakers, facility updates, highlights from young researchers, focused workshops, poster session, vendor reception, and awards banquet, this year's meeting will also celebrate the tenth anniversary of the ALS. Detailed information and online registration is now available at http://www-als.lbl.gov/als/usermtg/. Register by September 15 to receive an early registration rate of $150 (regular) or $60 (student). Discounted room rates at the nearby Hotel Durant will be available until September 27, 2003.

ALS users, postdocs, students, and staff are invited to submit abstracts online at http://www-als.lbl.gov/als/usermtg/abstracts.html. Highlight oral presentations will be selected from the submitted abstracts; others will be presented in the poster session. Abstracts must be received by September 8 to be considered for an oral presentation or the student poster competition. Abstracts received by September 22 are guaranteed space in the general poster session and inclusion in the program booklet.

Workshops for the second and third days of the meeting include the following:

- Applications of Variable Polarization in Soft X-Ray Microscopy and Spectroscopy
- Inelastic X-Ray Scattering and Ultra High Resolution Photoemission Studies of Strongly Correlated Systems
- Macromolecular Crystallography
- Molecular Environmental Sciences
- Recent Advances in Synchrotron-Based Microscopy

There will also be a joint ALS-SSRL workshop on Probing Mechanical Deformation and Failure via Synchrotron X Rays. For additional information about individual workshops, please contact the respective workshop organizer(s). Contact information is provided at http://www-als.lbl.gov/als/usermtg/workshops.html.

3. COLTRIMS WORK FEATURED IN PHYSICS TODAY

Cold-target recoil-ion-momentum spectroscopy (COLTRIMS) work done at the ALS by Timur Osipov et al. [Phys. Rev. Lett. 90, 233002 (2003)] is being featured this month in the Search and Discovery section of Physics Today. Headlined "Watching a Molecule Break Up Reveals How Quickly It Changes Shape," the article reports on the use of an innovative spectroscopic method to track and time how an acetylene molecule changes into its structural isomer, vinylidene. The COLTRIMS method involves splitting molecules into ionized fragments and analyzing the momenta of the various fragments in an applied electric field. It is a time-of-flight method that takes advantage of the "delayed" x-ray timing structure provided by two-bunch operation at the ALS. The technique was developed by a collaboration between groups from Kansas State University, Frankfurt University, Western Michigan University, and Berkeley Lab. In the experiment described in the article, the researchers deduced that it takes less than 60 femtoseconds to change doubly charged acetylene into vinylidene through the transfer of a hydrogen atom from one carbon atom to another. Previous COLTRIMS work by this collaboration was highlighted in ALSNews Vol. 189 (http://www-als.lbl.gov/als/science/sci_archive/46gasXPD.html).

4. ALS DOCTORAL FELLOWSHIP WINNERS ANNOUNCED

(Contact: ZHussain@lbl.gov)

The ALS is extremely pleased to announce this year's winners of ALS Doctoral Fellowships: Yulin Chen (Stanford Univ., spin-resolved photoemission spectroscopy), Mohammad F. Gharaibeh (Univ. of Nevada, Reno, ion spectroscopy), Darcy S. Peterka (Univ. of California, Berkeley, photoionization and photoelectron imaging of nanodroplets), Daniel Rolles (Technical Univ. of Berlin, coherence and nondipole effects in the photoionization of oriented molecules), Zhe Sun (Univ. of Colorado, high-resolution photoemission and diffuse scattering), Joshua Turner (Univ. of Oregon, coherent soft x-ray magnetic scattering), and Feng Wang (Univ. of Michigan, photoemission and spectroscopy of correlated systems). These exceptional Ph.D. students have been selected to perform a major part of their thesis work at the ALS during a one-year appointment covering the 2003 - 2004 academic year. For Daniel and Zhe, this will be a continuation of their fellowship grants from last year. Congratulations to all seven! The selection committee consisted of Sam Bader (Argonne National Laboratory and ALS Science Advisory Committee Chair), Jennifer Doudna (Univ. of California, Berkeley, and ALS Users' Executive Committee Chair), Franz Himpsel (Univ. of Wisconsin), Zahid Hussain (ALS), and Neville Smith (ALS). Detailed information about the fellowships, along with links to frequently asked questions and the application form, can be found at http://www-als.lbl.gov/als/fellowships/index.html.

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS. (The ALS will be running in two-bunch mode August 12 through 24.)

Beamline 1.4.3
Dan Fried (Univ. of California, San Francisco)
Ted Raab (Carnegie Institution of Washington)

Beamline 4.0.2
Steve Cramer (Univ. of California, Davis, and Berkeley Lab)
Nora Berrah (Western Michigan Univ.)

Beamlines 5.0.1, 5.0.2, 5.0.3
Ernst Ter Haar (Vertex Pharmaceuticals)
Kevin Parris (Wyeth-Ayerst Research)
Ed Berry, Li-Shar Huang, Graciella Salerno (Berkeley Lab)
Latesh Lad, Jonathan Friedman (Univ. of California, Irvine)
Armando Villasenor, Mark Knapp (Roche Bioscience)
Xueyong Zhu, Xiaoping Dai (The Scripps Research Institute)
Daniela Bumbaca, Mark Jedrzejas (Children's Hospital Oakland Research Institute)

Beamline 5.3.1
Harald Ade (North Carolina State Univ.)
Gary Mitchell (The Dow Chemical Company)
Adam Hitchcock (McMaster Univ., Canada)

Beamline 7.0.1
Marjorie Olmstead (Univ. of Washington)
Laurent Duda (Uppsala Univ., Sweden)

Beamline 7.3.1.1
Jo Stohr (Stanford Synchrotron Radiation Laboratory)
Andreas Scholl (Berkeley Lab)

Beamline 8.0.1
Maria Novella Piancastelli (Univ. of Rome)
Dennis Lindle (Univ. of Nevada, Las Vegas)

Beamlines 8.2.1, 8.2.2
Ailong Ke (Univ. of California, Berkeley)
Christopher Garcia, Marty Boulanger (Stanford Univ.)
Joseph Mougous (Univ. of California, Berkeley)
Jonathan Caruthers, David McKay (Stanford Univ.)

Beamline 8.3.1
Tom Lee (Univ. of California, San Francisco)
Adrian Keatinge-Clay (Univ. of California, San Francisco)
Ernst Bergmann, Craig Garen (Univ. of Alberta, Canada)
Anton Vila-Sanjurjo (Univ. of California, Berkeley)
Kam Zhang, Graeme Card (Plexxicon, Inc.)
Matt Good (Univ. of California, Berkeley)
Ho-Leung Ng (Univ. of California, Berkeley)

Geoffrey Facer, Shelley Godley (Fluidigm Corporation)
Stephanie Wang, Rick Huang (Univ. of California, San Francisco)
Eugene Hur (Univ. of California, San Francisco)

Beamline 9.0.2
Terrill Cool (Cornell Univ.)
Tomas Baer (Univ. of North Carolina)

Beamline 9.3.2
Nasser Hamdan (The American University of Sharjah, United Arab Emirates)
Mohamed Faiz (King Fahd University of Petroleum and Minerals, Saudi Arabia)
Felix Requejo (Berkeley Lab)
Simon Mun (Berkeley Lab)

Beamline 10.0.1
Nora Berrah (Western Michigan Univ.)
Z.X. Shen (Stanford Univ.)

Beamline 10.3.2
Daniel Grolimund (Paul Scherrer Institut, Switzerland)

6. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of July 8 - 13, 16 - 21, 22 - 28, and July 30 - August 3, the beam reliability (time delivered/time scheduled) was 97%. Of the scheduled beam, 90% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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LBNL/PUB-875
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

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ALSNews Vol. 228 August 20, 2003

Contents of This Issue:

1. PROTEIN PUMP REVEALS SECRETS OF DRUG RESISTANCE

by Dan Krotz
(Contact: GMcDermott@lbl.gov)

In the race to stay one step ahead of drug-resistant bacteria, scientists from the University of California at Berkeley and Berkeley Lab obtained high-resolution structures of AcrB, a bacterial protein complex that repels a wide range of antibiotics. The structures offer new insight into how bacteria survive attacks from different antibiotics, a growing health problem called multidrug resistance. As the team learned, these robust defenses are rooted in the protein complex's remarkable ability to capture and pump out a spectrum of structurally diverse compounds. The research may inform the development of antibiotics that either evade or inhibit these pumps, allowing drugs to slip inside bacteria cells and kill them.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/64acrb.html.

Publication about this research: E.W. Yu, G. McDermott, H.I. Zgurskaya, H. Nikaido, and D. Koshland, Jr., "Structural Basis of Multiple Drug-Binding Capacity of the AcrB Multidrug Efflux Pump," Science 300, 976 (2003).

2. SIBYLS BEAMLINE TAKING SHAPE, SEES FIRST LIGHT

(Contacts: SETsutakawa@lbl.gov, CBTrame@lbl.gov)

ALS Beamline 12.3.1, also called the Structurally Integrated Biology for Life Sciences (SIBYLS) beamline, achieved first light on June 27 and is currently undergoing commissioning. The new beamline, funded by the Department of Energy's Office of Biological and Environmental Research, is an essential component of a National Cancer Institute program ("Structural Cell Biology of DNA Repair Machines," or SBDR) aimed at understanding the function of dynamically assembled DNA repair machines. Understanding complex molecular machines requires an arsenal of techniques, and the SIBYLS beamline will have the unique ability to perform both protein crystallography (PX) of single crystals as well as small-angle x-ray scattering (SAXS) studies of proteins in solution. The PX capabilities will allow for the determination of protein structure using both high- and low-resolution diffraction data. SAXS can be used to identify discrete and stable complexes for crystallization trials, to provide low-resolution envelopes of their shapes, and to measure time-resolved conformational changes in proteins and macromolecular complexes in solution. Thus the combination of PX and SAXS capabilities will extend our understanding of proteins with time-resolved studies of the dynamic behavior of complex molecules.

The primary beam will be provided by the Sector 12 superconducting bend magnet. Two monochromators will be available: one for PX using high-resolution Si(111) crystals (5.5 - 17 keV) and another for SAXS using high-throughput multilayer mirrors (7 - 13 keV). The PX endstation will include an ADSC Q315 CCD detector, a gantry system for positioning of the detector relative to the sample, a beam diagnostics system, and many design features that have been successfully incorporated into other ALS beamlines. The SAXS endstation will include equipment allowing both static and time-resolved SAXS measurements: a Mar CCD165 detector, an Opotek VIBRANT 355 II tunable laser system, and a Unisoku mixing cell with 1.5-ms mixing times.

The interchange between the PX and SAXS endstations will be simple, and users will have the capability to do both types of experiments during one visit to the beamline. The inherent flexibility of the SIBYLS beamline design will allow for the maximization of the information collected from any individual sample, which is critical because sample preparation, not the speed of data collection, will be the limiting factor. This flexibility will allow researchers to bridge the gap between low-resolution studies of large protein complexes (using electron-microscope and SAXS techniques) and atomic-resolution single-crystal diffraction studies that advance the interpretive framework for molecular and cellular biology. The SIBYLS beamline will provide a critical facility for structural studies of macromolecular assemblies, not only for the SBDR project, but also for the greater scientific community.

John Tainer and Priscilla Cooper (Life Sciences Division) are the lead research scientists, aided by SAXS consultant Hiro Tsuruta (Stanford Univ.) and collaborator James Holton (Physical Biosciences Division). Beamline design and construction was done in collaboration with an ALS scientific and engineering team led by Alastair MacDowell (ALS Experimental Systems Group). The PX endstation will begin sample testing in October 2003, and the SAXS endstation is scheduled to begin first test data collection in September 2003. Additional information about SIBYLS can be found online at http://www.sibyls.org/ and http://www.sbdr.lbl.gov/.

3. SRI 2003 SIDELIGHT: SAUL PERLMUTTER ON THE FATE OF THE UNIVERSE

(Contact: EJMoxon@lbl.gov)

Will the universe last forever, or will it someday come to an end? Attendees of SRI 2003 looking for a little diversion will have the opportunity to hear Berkeley Lab astrophysicist Saul Perlmutter, leader of the Supernova Cosmology Project (SCP), speak on "Supernovae, Dark Energy, and the Accelerating Universe" at 7:00 P.M. on Wednesday, August 27, at the Yerba Buena Center for the Arts Theater (where SRI 2003 plenary sessions will be held). The talk is free and open to the public.

Surprisingly, the apparently philosophical question about the fate of the universe can be answered empirically. Light from the cataclysmic explosions of distant stars--supernovae--provides us with natural mile markers that can be used to track the past expansion of the universe and extrapolate its fate. The most recent results are unsettling, at least to physicists. It appears that the universe will last forever, and that its expansion will speed up indefinitely. If so, some fundamental physics concepts may need to be revised, and some mysterious "dark energy"--perhaps Einstein's "cosmological constant"--may pervade the universe. This is the first decade in which we can begin to answer such cosmological questions with a variety of measurement techniques. Science magazine named SCP measurements of the accelerating universe the 1998 "Breakthrough of the Year." For more about the speaker and venue, go to http://www.sri2003.lbl.gov/html/publicscience.html.

4. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Jennifer Doudna
(Contact: doudna@uclink.berkeley.edu)

Greetings from the UEC. At our meeting on July 16, we discussed several topics of current interest to users. Greg Denbeaux reported that the users' lobbying trip to Washington in April was highly successful, raising awareness among our Congressional reps of the exciting science carried out at synchrotrons around the country. It was suggested that a letter-writing campaign in support of increased funding for synchrotron research could be coordinated through the UEC, and this will be discussed further at our upcoming Users' Meeting in October. Progress on the planned ALS upgrades include a two-step schedule, beginning with an increase in the time-averaged curent by a factor of three and a move to "top-off" mode injection of the ring. Following these changes, new insertion devices and beamlines will be phased in. The UEC agreed that these changes will benefit the entire user community and will also discuss the changes at our upcoming October meeting. Finally, planning for the new user building and housing are under way, and the UEC reviewed current drafts of the user building layout.

Users are encouraged to check out the Web site for the upcoming Users' Meeting October 6-8 (http://www-als.lbl.gov/als/usermtg/) and plan to attend. Five exciting workshops will focus on recent advances in microscopy, molecular environmental sciences, x-ray crystallography, materials science, and inelastic x-ray scattering. We'll see you there!

5. SUBMIT YOUR RECOMMENDATIONS FOR UEC NOMINEES

(Contact: AMGreiner@lbl.gov)

The UEC is currently seeking recommendations from ALS users for nominees to be placed on the ballot for this fall's UEC election. Note that these are not direct nominations; a UEC committee will consider these recommendations in drawing up a candidate list. Direct nominations from members of the ALS Users' Association may also be made by petition on an official nomination form. These require the signed endorsement of five Users' Association members and must be mailed or turned in at the upcoming Users' Meeting in October. A simple online form for recommendations as well as a downloadable nomination form (in PDF format) can be found at the UEC election Web site (http://www-als.lbl.gov/als/uec/vote/).

The deadline for submitting recommendations is September 22, and the deadline for submitting signed nomination forms is October 8. The final slate of candidates will be announced on the election Web site on October 14. Voting will take place online from October 14 to November 14, and the results will be posted on November 18. The newly elected UEC members will take office for a three-year term beginning in January 2004 and ending in January 2007.

6. WHO'S IN TOWN: A SAMPLING OF ALS USERS

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Beamline 1.4.3
John Bradley (Lawrence Livermore National Laboratory)
Dan Fried (Univ. of California, San Francisco)

Beamline 4.0.2
Nora Berrah (Western Michigan Univ.)
Jo Stohr (Stanford Synchrotron Radiation Laboratory)
Boris Sinkovic (Univ. of Connecticut)

Beamline 5.3.2

Adam Hitchcock (McMaster Univ., Canada)
Harald Ade (North Carolina State Univ.)

Beamline 7.0.1
James Allen (Univ. of Michigan)
M. Zahid Hasan (Princeton Univ.)
Sergei Butorin (Uppsala Univ., Sweden)

Beamline 7.3.3
Ersan Ustundag (California Institute of Technology)

Beamline 8.0.1
Dennis Lindle (Univ. of Nevada, Las Vegas)
David Sherman (Univ. of Bristol, UK)

Beamline 9.0.2
Tomas Baer (Univ. of North Carolina)

Beamline 9.3.2
Suntharampillai Thevuthasan (Pacific Northwest National Laboratory)

Beamline 10.0.1
David Pegg (Univ. of Tennessee)

Beamline 10.3.1
Eleanor Blakely (Berkeley Lab)

Beamline 10.3.2
Andrei Istratov (Berkeley Lab)

7. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of August 5 - 10 and 12 - 18 (two-bunch mode), the beam reliability (time delivered/time scheduled) was 99%. Of the scheduled beam, 98% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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LBNL/PUB-875
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

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ALSNews Vol. 229 September 3, 2003

Contents of This Issue:

1. A WEEK OF SRI 2003 IN SAN FRANCISCO

by Art Robinson
(Contacts: HAPadmore@lbl.gov, stohr@ssrl.slac.stanford.edu)

The Eighth International Conference on Synchrotron Radiation (SRI 2003) ended its August 25 - 29 run at the Yerba Buena Center for the Arts in San Francisco with almost as many in attendance as at the beginning. The steady attendance was surely a tribute to the quality of the program and the excitement it generated among the 767 registrants who gathered for four days of plenary talks, parallel sessions, and posters, as well as facility tours of the ALS and Stanford Synchrotron Radiation Laboratory (SSRL).

On Monday, conference co-chairs Howard Padmore of the ALS and Jo Stohr of SSRL jump-started the proceedings with an introduction in the style of two television commentators setting the stage before a major sports event. Passing the microphone back and forth, they explained the structure of the meeting and the choices of topics and speakers for the plenary talks that occupied the morning of each conference day.

After the plenary talks, which were designed to be tutorial and wide-ranging in their coverage of broad topics, more detailed views of specific developments were given by speakers in afternoon parallel sessions. In addition, for still more detail, poster sessions were held each day after lunch and at the end of the day in conjunction with exhibits by 39 vendors. These vendors also generously provided for food and beverages early in the morning, during meeting breaks, and at the end of the day during the poster sessions.

On Wednesday evening, conference attendees, their partners, and the general public were treated to a free public science lecture by Saul Perlmutter (Berkeley Lab), who spoke on "Supernovae, Dark Energy, and the Accelerating Universe." About 400 took advantage of the opportunity to hear this awarding-winning scientist discuss ways that observational science might help answer the question "Will the universe last forever, or someday will it come to an end?" Earlier in the day, the public and conference attendees also had a chance to view an exhibition of ALS-themed artwork created by students from the Univ. of California, Berkeley. The artwork complemented other informational material and a superb mechanical model provided by Masahiro Hara of SPring-8 that demonstrated how a linear accelerator works.

Closing out the formal presentations on Thursday afternoon, Friso van der Veen (Paul Scherrer Institut, Switzerland) attempted to summarize the week's proceedings with remarks titled "Synchrotron light of the third and fourth generation - How to fill the generation gap." After noting that being selected as the conference closeout speaker plainly placed him well beyond the peak of his scientific career, van der Veen gave a whirlwind yet almost encyclopedic tour of the conference from sources to detectors. Many of his highlights reflected well on the ALS and its users. In the

end, he concluded, there would be no problem filling the gap by the next SRI conference because every three years synchrotron performance increases by an order of magnitude in one parameter or another, thanks to the instrumentation scientists who make it all happen.

Padmore and Stohr then returned to the podium to end the conference and to report two pieces of news. First, the International Advisory Committee, consisting of the directors of operating synchrotron light sources, would be developing a formal constitution with an eye toward possibly widening its role in the synchrotron radiation world beyond its role in selecting the site of the triennial SRI conferences. Second, the ninth international conference, SRI 2006, was awarded to Korea. Hosted by the Pohang Light Source, the conference will be held at the Bomun Resort in Gyeongju, about 30 minutes from the PLS. Check http://www.gyeongju.gyeongbuk.kr/en/ for information about this area, which was the site of Korea's capital in centuries past.

With the formalities completed, some 300 conference attendees repaired to the Yank Sing restaurant at the nearby Rincon Center in San Francisco for a multicourse feast as well as a dramatic performance by two pairs of Chinese lion dancers. On Friday, those interested were invited to tour either the ALS or SSRL. About 110 people chose to visit the ALS. Divided into ten groups, each with its own guide, the visitors were able to tour several beamlines before breaking up to spend more time at specific beamlines of their choice. The conference proceedings will published by the American Institute of Physics, with Tony Warwick (ALS) and John Arthur (SSRL) as the editors. Organizers are also planning to post viewgraphs from the plenary and contributed talks online. Check the conference Web site (http://www.sri2003.lbl.gov/) for the latest information.

2. FIRST LIGHT AT MOLECULAR BIOLOGY CONSORTIUM BEAMLINE

(Contacts: EWestbrook@lbl.gov, Matsumur@UIC.edu)

At 11:15 A.M. PDT on August 19, 2003, ALS Beamline 4.2.2, also known as the Molecular Biology Consortium (MBC) beamline, received its first x-ray light from the ALS storage ring. This new beamline is funded by a unique consortium of universities and medical schools whose member faculty, while not necessarily crystallographers themselves, require crystallography-based structural information at the nanometer scale of the complex molecular machines that direct life. The beamline's "Yellow Hutch" will be a workhorse, generating high-quality structural molecular biology information quickly, to solve structures that are important for our understanding of life processes at the molecular level. The other important theme of the MBC beamline will be the development of detector technology for synchrotron science.

The primary beam will be provided by the Sector 4 superconducting bend magnet. The MBC beamline's x-ray optics, designed and fabricated by Gerold Rosenbaum (Univ. of Georgia) and Larry Rock (LR Design, Scottsdale, AZ), are closely derived from optics implemented at highly productive lines at Brookhaven and Argonne storage rings. It is noteworthy that the 4.2.2 beam is horizontally focused with a sagittally bent second crystal in the monochromator, whereas vertical focus is provided by bending a flat mirror, so horizontal and vertical foci are independently controlled by the user. The endstation features a Rosenbaum-Rock mini-kappa goniostat that permits the user to arbitrarily orient the sample crystal relative to the beam. The entire superbend beam will focus onto a 120- by 40-micrometer stage, thus providing a flux density commensurate with the brightest structural biology beamlines at any synchrotron light source. The beamline is controlled with the same software (Experimental Physics and Industrial Controls System, or EPICS) used to control the ALS itself. The beamline will feature advanced detectors being developed by MBC with funding from the National Institutes of Health, the National Science Foundation, and the Department of Energy.

Members of the MBC Science Advisory Committee typify the community's philosophy: John Kappler (National Jewish Medical Center, Denver), Mel Simon (California Institute of

Technology), and Dan Koshland (Univ. of California, Berkeley) are all National Academy members who are not crystallographers but need the information that crystallography provides. Thus, the MBC beamline will provide a high-quality facility that can be used by nonexperts, with 25% of the beam time allocated for general users. In addition, 10% of the beam time will be used for technology development, particularly in the field of x-ray detectors.

Edwin Westbrook (EWestbrook@lbl.gov) and Philip Matsumura (Matsumur@UIC.edu) are the lead research scientists. Lin-Bo Yang (LBYang@lbl.gov) and Darren Sherrell (DASherrell@lbl.gov) are MBC scientific staff on-site at ALS. The beamline is currently in a 4- to 6-week commissioning period and is expected to begin operation in late October. Additional information about the MBC can be found online at http://www.uic.edu/orgs/mbc/. The MBC is a nonprofit corporation incorporated in the state of Illinois and dedicated to basic and applied research in biological science and synchrotron technology.

3. ALS USERS' MEETING 2003 UPDATE

(Contact: alsum2003@lbl.gov)

General information, meeting deadlines, and online registration for this year's ALS Users' Meeting, to be held at Berkeley Lab October 6 - 8, is available on the Users' Meeting Web site at http://www-als.lbl.gov/als/usermtg/. The early registration deadline is Monday, September 15. Information about accommodations for meeting participants in local hotels is available at http://www-als.lbl.gov/als/usermtg/accommodations.html.

Abstract Submission

The abstract submission deadline for oral presentations and the student poster competition is Monday, September 8. See instructions for online submission at http://www-als.lbl.gov/als/usermtg/abstracts.html.

Workshops

This year, five focused workshops will follow the formal Users' Meeting program on Tuesday, October 7, and Wednesday, October 8. The workshop topics are listed below:

- Applications of Variable Polarization in Soft X-Ray Microscopy and Spectroscopy
- Inelastic X-Ray Scattering and Ultrahigh Resolution Photoemission Studies of Strongly Correlated Systems
- Macromolecular Crystallography

The following workshops are being held jointly with SSRL:

- Probing Mechanical Deformation and Failure via Synchrotron X Rays
- Recent Advances in Synchrotron-Based Microscopy

Interested participants are encouraged to contact the workshop leaders directly at http://www-als.lbl.gov/als/usermtg/workshops.html for more detailed information about workshop agendas and speakers.

4. CALL FOR ALS USERS' MEETING AWARD NOMINATIONS

(Contact: EJMoxon@lbl.gov)

Each year, the ALS Users' Executive Committee (UEC) presents awards to scientists and staff who have made significant contributions to the ALS scientific and user support programs. This year, the UEC invites ALS users and staff to submit nominations for any or all of the following awards:

- David A. Shirley Award for Outstanding Scientific Achievement at the Advanced Light Source
- Klaus Halbach Award for Innovative Instrumentation at the Advanced Light Source
- Tim Renner User Services Award

The nominations may be for an individual or a group, and a brief rationale for the nomination(s) is required. Past award winners, along with a representative from the UEC and the ALS, will serve on the award selection committee. To submit a nomination, go to the 2003 ALS Users' Meeting Award Nominations Web page at http://www-als.lbl.gov/als/usermtg/nominations.html. The deadline for nominations is Tuesday, September 30. The awards will be presented at the ALS Users' Meeting dinner/buffet on Tuesday, October 7.

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
John Bradley (Lawrence Livermore National Laboratory)
Dan Fried (Univ. of California, San Francisco)
Ted Raab (Carnegie Institution of Washington)

Beamline 4.0.2
Chuck Fadley (Univ. of California, Davis)

Beamline 5.3.2
Gary Mitchell (The Dow Chemical Company)
Adam Hitchcock (McMaster Univ., Canada)
Harald Ade (North Carolina State Univ.)

Beamline 7.0.1
Elaine Seddon (Daresbury Laboratory, UK)
Steve Kevan (Univ. of Oregon)
Sergei Butorin (Uppsala Univ., Sweden)

Beamline 7.3.1.1
Kai Starke (Freie Univ. Berlin, Germany)
Jo Stohr (Stanford Synchrotron Radiation Laboratory)

Beamline 8.0.1
Alexander Moewes (Univ. of Saskatchewan, Canada)
Jeffrey Kortright (Berkeley Lab)

Beamline 8.2.1
Shigeo Matsuda, Kenichi Hitomi (The Scripps Research Institute)

Beamline 8.3.1
Evette Radisky, Justin Lee, Kaoru Yoshida, Zeon Chen (Univ. of California, Berkeley)
Stephanie Wang (Univ. of California, San Francisco)
Tom Lee (Univ. of California, San Francisco)

Maria Borovinskaya (Berkeley Lab)

Beamline 9.3.2
Frank Ogletree (Berkeley Lab)
Bongjin Mun (Berkeley Lab)
Glenn Waychunas (Berkeley Lab)

Beamline 10.0.1
Z.-X. Shen (Stanford Univ.)
Michael Lubell (American Physical Society)

Beamline 10.3.2
Brandy Toner (Univ. of California, Berkeley)
Andrei Istratov (Berkeley Lab)

Beamline 12.0.1
Alexei Fedorov (Berkeley Lab)
Michael Shumway (Berkeley Lab)
Kris Rosfjord (Berkeley Lab)

6. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of August 19 - 24 (two-bunch mode) and 27 - 31, the beam reliability (time delivered/time scheduled) was 94%. Of the scheduled beam, 88% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

LBNL/PUB-875
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov, ejmoxon@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 230 September 17, 2003

Contents of This Issue:

1. NEW STUDY EXTENDS ANALYSIS OF 9/11 AIR QUALITY

(Contact: sscliff@ucdavis.edu)

A new study of World Trade Center air samples analyzed in large part at the ALS puts forth a model for how the debris pile acted like a chemical factory, cooking together the components of the buildings and their contents to give off gases of toxic metals, acids, and organics. The study also confirms preliminary reports on the size, composition, and origin of the pollutants ejected after the towers' collapse. ALS Beamline 10.3.1 user Tom Cahill (Univ. of California, Davis) was invited to present his research team's latest findings in a special symposium on the World Trade Center held on September 10 as part of the 226th National Meeting of the American Chemical Society (ACS) in New York City. Cahill leads the DELTA Group (Detection and Evaluation of Long-Range Transport of Aerosols), a collaboration of aerosol scientists that has made detailed studies of aerosols from volcanic eruptions and global dust storms as well as from the 1991 Gulf War oil fires.

Between October 2 and December 20, 2001, the DELTA Group collected air samples from a site about a mile north of Ground Zero. Preliminary results were released in February 2002 (see ALSNews Vol. 193 at http://www-als.lbl.gov/als/als_news/news_archive/vol.193_022002.html), and the peer-reviewed findings have been accepted for publication in the Journal of Aerosol Science and Technology. Additional samples were collected from a rooftop adjacent to the site in May 2002 (in collaboration with the American Lung Association of New York), and analysis of both sets of data continued through late summer 2002. The samples were examined using a variety of techniques, including electron microscopy at UC Davis and scanning transmission ion spectroscopy at Lawrence Livermore National Laboratory. The brightness and energy range of ALS Beamline 10.3.1 is ideally suited to soft x-ray fluorescence spectroscopy of extremely fine metal particles adhering to the sampling system's mylar substrate.

The results show unprecedented levels of aerosols--extremely fine particles (between 90 and 340 nm in diameter)--of sulfur and silicon and of metals such as iron, titanium, vanadium, nickel, copper, and zinc. The researchers argue that this unique compositional "signature," along with back-trajectory modeling, points convincingly to the debris pile as the source of the pollution, as opposed to possible regional or local sources such as upwind power plants or the diesel trucks used to haul away debris. They also theorize that the burning of items containing polyvinyl chloride (PVC) such as pipes, wiring, blinds, and upholstery produced chlorinated compounds, which supress the boiling point of metals and facilitate their release into the atmosphere in the form of aerosols. "Now that we have a model of how the debris pile worked," said Cahill, "it gives us a much better idea of what the people working on and near the pile were actually breathing." A copy of Cahill's ACS presenation is available online at http://delta.ucdavis.edu/WTC.htm.

2. LIVERMORE JOINS CALIPSO PROGRAM FOR HIGH-PRESSURE SCIENCE

(Contact: SMClark@lbl.gov)

With the payment of a $150K contribution, Lawrence Livermore National Laboratory (LLNL) recently became the seventh member of a consortium of institutions that constitute the California High-Pressure Science Observatory (CALIPSO) program, centered around a number of beamlines at the ALS. The field of high-pressure science has been revolutionized by the development of diamond-anvil pressure cells and laser heating techniques. With these devices, materials can be subjected to pressures of over eight million atmospheres (800 GPa) and temperatures of over 6000 K, far in excess of the pressures and temperatures at the center of the Earth. Materials that normally may be quite mundane can, under such extreme conditions, display new chemical and physical properties, leading to the discovery of a totally "new" periodic table as well as a better understanding of the structures of planets and small stars.

To reach these temperatures and pressures, samples have to be small; usually only a few nanoliters. Thus, high-brightness synchrotron radiation is absolutely essential to probing the state of the small quantities of matter contained in high-pressure cells. The CALIPSO program is currently focused on developing a new beamline at the ALS (Beamline 12.2.2) designed for studying materials held in diamond-anvil cells and heated with lasers. The beamline will make use of the hard x rays from a superbend magnet to enable x-ray diffraction and x-ray spectroscopic measurements. The partners in this project are Berkeley Lab; the Univ. of California (UC) Berkeley Departments of Chemistry and Earth and Planetary Sciences; the UC Santa Cruz Department of Earth Sciences; the UC Los Angeles Department of Chemistry; the Consortium for Materials Properties Research in Earth Science (COMPRES); and LLNL. On August 19, LLNL representatives Joe Zaug, Lou Terminello, and Pattrick Allen presented a symbolic check for $150K to ALS representatives Neville Smith, Ben Feinberg, and Howard Padmore, while CALIPSO program manager Simon Clark (ALS) and other project members looked on.

3. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Jennifer Doudna
(Contact: doudna@uclink.berkeley.edu)

This has been a busy month for the UEC. In addition to putting the final touches on plans for the upcoming Users' Meeting to be held October 6 - 8 (see http://www-als.lbl.gov/als/usermtg/), the UEC has been involved in ongoing discussions about how to streamline ALS access for foreign users. The goal is to comply with security guidelines while minimizing the difficulties encountered by foreign scientists working at the ALS. Users who have concerns in this regard are encouraged to contact a UEC member (http://www-als.lbl.gov/als/uec/UECcontacts.html).

In an exciting step towards a coordinated lobbying effort, the ALS UEC is working with other UEC committees at synchrotron light sources around the country to alert our congressional reps about the importance of continued government funding. The UEC chairs will be sending a joint letter to Senate and House members involved in budgetary decisions, and we will also be asking individual users to get involved as they see fit. More information will be provided at the Users' Meeting, or you can contact one of the UEC members to request a sample letter.

Another ongoing topic of discussion is the plan to build LUX, a linac-based ultrafast x-ray source that could be used for a wide variety of pump-probe type experiments with hard and soft x rays. A meeting held on September 10 included participants representing various fields of physics, chemistry, and biology to brainstorm about the kinds of questions that could be addressed by LUX. Users are encouraged to think about the possibilities that this kind of facility will offer and to bring ideas to the Users' Meeting or to your UEC.

Last but certainly not least, a subgroup of UEC members met on September 11 for the very important task of selecting the best vintage beverages for the Users' Meeting. We hope to enjoy the fruits of these labors with you at the meeting in October. See you there!

4. RECOMMENDATIONS FOR UEC NOMINEES DUE MONDAY

(Contact: AMGreiner@lbl.gov)

The UEC is seeking user input in developing the slate of candidates for this year's UEC election. The deadline for submitting recommendations for nominees is Monday, September 22. To make a recommendation, go to the UEC election Web site at http://www-als.lbl.gov/als/uec/vote/ and click on "Nominations." Note that these are not direct nominations; a UEC committee will consider these recommendations in drawing up a candidate list. Direct nominations may also be made by petition on an official nomination form. These require the signed endorsement of five Users' Association members and must be mailed or turned in at the upcoming Users' Meeting by October 8. The final slate of candidates will be announced on the election Web site on October 14. Voting will take place online from October 14 to November 14, and the results will be posted on November 18. To vote, ALS users must have a current email address on file with the User Services Office (contact alsuser@lbl.gov to update your information).

5. BERKELEY LAB CAFETERIA BEGINS TRIAL DINNER SERVICE

Based largely on an overwhelmingly positive response to a recent survey of employees, the Berkeley Lab cafeteria began a month-long trial dinner service this week. The menu will feature such items as steaks, fresh fish, and whole roasted chickens, available each weekday evening from 5 to 7 P.M. Patrons will have the option of either take-out or in-hall dining. After a month, the dinner service will be evaluated and a decision made on whether or not to continue. Weekly dinner menus will soon be posted online at http://www.lbl.gov/Workplace/cafeteria/.

6. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Ted Raab (Carnegie Institution of Washington)
Hoi-Ying Holman (Berkeley Lab)

Beamline 4.0.2
Jo Stohr (Stanford Synchrotron Radiation Laboratory)
Jeffrey Kortright (Berkeley Lab)

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Gary Mitchell (The Dow Chemical Company)
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Steven Urquhart (Univ. of Saskatchewan, Canada)
Harald Ade (North Carolina State Univ.)
Rainer Fink (Univ. Erlangen, Germany)

Beamline 7.0.1
Steve Kevan (Univ. of Oregon)

James Allen (Univ. of Michigan)
Stephen Cramer (Univ. of California, Davis)
Byron Freelon (Berkeley Lab)
Kai Starke (Freie Univ. Berlin, Germany)
Joseph Nordgren (Uppsala Univ., Sweden)
Changyoung Kim (Yonsei Univ., Korea)

Beamline 7.3.1.1
Jo Stohr (Stanford Synchrotron Radiation Laboratory)
Sergiy Minko (Institute of Polymer Research Dresden, Germany)
Z.Q. Qiu (Univ. of California, Berkeley)

Beamline 7.3.3
Ersan Ustundag (California Institute of Technology)

Beamline 9.0.1
Janos Kirz (Stony Brook Univ.)

Beamline 9.3.2
Frank Ogletree (Berkeley Lab)
Suntharampillai Thevuthasan (Pacific Northwest National Laboratory)

Beamline 10.0.1
Ron Phaneuf (Univ. of Nevada, Reno)
Z.X. Shen (Stanford Univ.)
Alfred Mueller (Justus Liebig Univ., Germany)

Beamline 10.3.2
John Bargar (Stanford Synchrotron Radiation Laboratory)
Yuji Arai (U.S. Geological Survey)

7. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of September 3 - 7 and 10 - 15, the beam reliability (time delivered/time scheduled) was 95%. Of the scheduled beam, 80% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

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ALSNews Vol. 231 October 1, 2003

Contents of This Issue:

1. NOGO RECEPTOR YIELDS FRAMEWORK FOR NEURON-REPAIR STUDIES

by Dan Krotz
(Contact: GMcDermott@lbl.gov)

Scientists are inching closer to a cure for spinal cord injuries, thanks to a research team that used the ALS to determine the structure of a protein that prevents neurons from repairing themselves. The protein is dubbed the Nogo receptor because it binds with several other proteins that block neural growth. It is found on the surface of thin fibers, called axons, which carry information along neurons in the brain and spinal cord. Researchers believe that if they can pharmaceutically block the interaction between the Nogo receptor and these growth-inhibiting proteins, then severed neurons may fuse back together, and paralyzed people could walk again.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/66nogo.html.

Publication about this research: X.L. He, J.F. Bazan, G. McDermott, J.B. Park, K. Wang, M. Tessier-Lavigne, Z. He, and K.C. Garcia, "Structure of the Nogo Receptor Ectodomain: A Recognition Module Implicated in Myelin Inhibition," Neuron 38, 177 (2003).

2. ATTWOOD, MARX TO HIGHLIGHT ALS HISTORY AT USERS' MEETING

(Contact: alsum2003@lblgov)

In a special "ALS 10-Year Retrospective" session at next week's ALS Users' Meeting, David Attwood and Jay Marx (both of Berkeley Lab) will chronicle the twists and turns in the ALS's journey from concept through construction. David Attwood, who served as ALS scientific director in the late eighties, will recount "The Impossible Dream," about how the ALS came to be. Jay Marx, who served as the ALS project director, will recall "The Construction of the ALS--A Personal Retrospective." Also, many veteran ALS project members will be invited guests at the early evening reception on Monday, which will also feature an exhibit of photos depicting the construction of the ALS. The retrospective theme will continue on Tuesday with the dedication of the main ALS conference room in honor of Klaus Halbach, inventor of the permanent-magnet insertion devices--wigglers and undulators--that changed forever the way we think about synchrotron radiation facilities.

An updated program for the meeting, including a list of the young researchers and highlights speakers, has been posted online at http://www-als.lbl.gov/als/usermtg/agenda.html. Online registration is still open at http://www-als.lbl.gov/als/usermtg/registration.html. The registration fee covers attendance at all sessions (including the poster session, vendor exhibits, and workshops), meeting materials, lunches, coffee breaks, the reception, the buffet/awards dinner, and an ALS 10th anniversary T-shirt.

3. SHIRLEY, HALBACH, AND RENNER AWARD NOMINATIONS STILL OPEN
(Contact: EJMoxon@lbl.gov)

Now is the time to submit your nomination(s) for the Shirley (science), Halbach (instrumentation), and Renner (user service) Awards. The deadline has been extended to the close of business at Berkeley Lab tomorrow, October 4. To submit a nomination, go to the 2003 ALS Users' Meeting Award Nominations Web page at http://www-als.lbl.gov/als/usermtg/nominations.html. The nominations may be for an individual or a group, and a brief rationale for the nomination(s) is required. Past award winners, along with a representative from the UEC and the ALS, will serve on the award selection committee. The awards will be presented at the ALS Users' Meeting dinner/buffet on Tuesday, October 7.

4. VUV14 TO BE HELD IN CAIRNS, AUSTRALIA, JULY 2004
(Contact: vuv14@anu.edu.au)

Mark your calendars: the Fourteenth International Conference on Vacuum-Ultraviolet Radiation Physics (VUV14) will be held in Cairns, Australia, July 19 - 23, 2004. This will be the first visit to the Southern Hemisphere in the 40-year history of the VUV conference series, which began in Los Angeles in 1962 and is now run triennially, with the most recent conference (VUV13) held in Trieste, Italy, in 2001. VUV12 was hosted by the ALS in 1998. The conference Web address is http://vuv14.anu.edu.au/.

VUV14 will encompass all aspects of theoretical and experimental studies of the interaction of ultraviolet and x-ray radiation with matter over a photon energy range from a few eV to many keV. Relevant areas of research include, but are not limited to, atomic and molecular science, materials science, surface science, condensed-matter science, soft-matter science, and other aspects of physics, chemistry, and biology, together with the novel instrumentation required to conduct such research. The major tools of investigation, e.g. synchrotron radiation, lasers, laboratory sources, and plasma sources, are important topics, as are the associated optics, technology, and analytical techniques.

To subscribe to the VUV14 mailing list, visit http://mailman.anu.edu.au/mailman/listinfo/vuv14list/ and follow the instructions or email vuv14@anu.edu.au and ask to be subscribed.

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

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Hoi-Ying Holman (Berkeley Lab)

Beamline 4.0.2
Luis Miguel Garcia Vinuesa (Univ. of Zaragoza, Spain)
Kai Liu (Univ. of California, Davis)
Jeffrey Kortright (Berkeley Lab)
James Tobin (Lawrence Livermore National Laboratory)

Beamlines 5.0.1, 5.0.2, 5.0.3

Marc Whitlow, Marc Adler (Berlex Biosciences)
Sutapa Ghosh, Elise Sudbeck (Celgene Corporation)

Beamline 5.3.2
Rainer Fink (Univ. Erlangen, Germany)
Gary Mitchell (The Dow Chemical Company)
Harald Ade (North Carolina State Univ.)
Adam Hitchcock (McMaster Univ., Canada)
Stephen Urquhart (Univ. of Saskatchewan, Canada)

Beamline 7.0.1
Changyoung Kim (Yonsei Univ., Korea)
Kai Starke (Freie Univ. Berlin, Germany)
Lars Johansson (Karlstad Univ., Sweden)
Z.Q. Qiu (Univ. of California, Berkeley)

Beamline 7.3.3
John Bargar (Stanford Synchrotron Radiation Laboratory)
Alain Manceau (Univ. Joseph Fourier, France)

Beamline 8.0.1
Thomas Callcott (Univ. of Tennessee)
David Ederer (Tulane Univ.)
Jin Nakamura (Univ. of Electro-Communications, Japan)
Yasuji Muramatsu (Japan Atomic Energy Research Institute)

Beamlines 8.2.1, 8.2.2
Thiang Yian Wong (The Burnham Institute)
Ailong Ke (Univ. of California, Berkeley)
Joseph Mougous (Univ. of California, Berkeley)

Beamline 8.3.1
Shahram Khademi, William Harries (Univ. of California, San Francisco)
Kevin Slep (Univ. of California, San Francisco)
Joy Huffman, Magnar Bjoras, Kenichi Hitomi, Atsushi Yamagata (The Scripps Research Institute)
Graeme Card, Kam Zhang, Abhinav Kumar (Plexxicon, Inc.)
Evette Radisky, Justin Lee, Karen Lu (Univ. of California, Berkeley)
Sibyl Baladi (Univ. of California, Berkeley)

Beamline 9.0.1
Janos Kirz (Stony Brook Univ.)

Beamline 9.3.2
Piero Pianetta (Stanford Synchrotron Radiation Laboratory)
Phil Ross (Berkeley Lab)

Beamline 10.0.1
Dan Dessau (Univ. of Colorado at Boulder)
Z.X. Shen (Stanford Univ.)
Laurent Duda (Uppsala Univ., Sweden)

6. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user runs of September 16 - 22 and 24 - 29, the beam reliability (time delivered/time scheduled) was 91%. Of the scheduled beam, 79% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

LBNL/PUB-875
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 232 October 15, 2003

Contents of This Issue:

1. USERS' MEETING FEATURES ALS 10TH ANNIVERSARY CELEBRATION

by Art Robinson
(Contact: doudna@uclink.berkeley.edu)

The ALS saw first light on October 5, 1993, not quite to the day but close to 10 years before this year's annual ALS Users' Association Meeting, held October 6 - 8. No one among the 289 registered attendees sang "Happy Birthday to You," but there were slides with birthday cakes in the presentations by ALS Director Daniel Chemla and DOE Associate Director of Basic Energy Sciences Patricia Dehmer. Fittingly, the proceedings included retrospectives from two of the key players in the early history of the ALS, David Attwood and Jay Marx, a display of photographs chronicling its construction and commissioning, and a dedication of the main ALS conference room to the late Klaus Halbach, inventor of the permanent-magnet insertion devices that in part motivated building the ALS and other third-generation synchrotron light sources optimized for high brightness.

Berkeley Lab Director Charles Shank welcomed attendees with a spirited endorsement of the plans for an ALS performance upgrade that would keep the facility at the forefront of the field for the next two decades. Chemla presented a report on past accomplishments and future plans, including a look at the kinds of science to come. Featured prominently in his description, the proposed upgrade would increase the ALS brightness in a phased, four-year project covering the storage ring, insertion devices, and beamlines. After casting a brief glimpse back at the history of third-generation synchrotron facilities in the U.S., Dehmer turned her attention to the 20-year DOE roadmap now under development for facilities and noted that one of the highest recommendations of the Basic Energy Sciences Advisory Committee (BESAC) was for "Light Source Facilities Upgrades."

The remainder of the morning was devoted to a Town Meeting. ALS Deputy for Operations Ben Feinberg emphasized safety, including a new effort to clean up the increasingly busy experiment hall floor, and summarized plans for a new user building, to be completed by early 2008. Accelerator Physics Group Leader David Robin reviewed the ingredients in the accelerator portion of the ALS upgrade, primarily quasi-continuous injection (top-off) at 1.9 GeV and a higher beam current. ALS Deputy for Science Neville Smith noted that determining the complement of advanced insertion devices and application-specific beamlines for the upgrade could not be done without user input. ALS User Services Group Leader Gary Krebs briefly reviewed the hopeful status of a proposed on-site user housing facility (user hostel). Finally, outgoing Users' Executive Committee chair Jennifer Doudna (Univ. of California, Berkeley) encouraged users to participate in a letter-writing campaign to influence pending legislation that could increase funding for synchrotron facilities and science.

Science highlights, highlights from young researchers, and posters constituted the meat of the program on Monday afternoon and Tuesday morning, while six workshops (two held at SSRL)

took over Tuesday afternoon and all day Wednesday (see the meeting program at http://www-als.lbl.gov/als/usermtg/ for details). Generous support from equipment vendors underwrote refreshments during the receptions at the end of the first two days.

After a buffet dinner on Tuesday evening, user meeting co-chairs Eli Rotenberg (ALS) and Gerry McDermott (Berkeley Lab) presented awards. The student poster competition was won by Tonio Buonassisi (Univ. of California, Berkeley) for a study of copper contaminants in polycrystalline silicon solar cell material. The Tim Renner User Services Award went to Donna Hamamoto (ALS Beamline Coordination). Xing-Jiang Zhou (Stanford Univ. and Berkeley Lab) took home the David A. Shirley Award for Outstanding Science for his angle-resolved photoemission studies of high-temperature superconductors. And Ruth Halbach presented the Klaus Halbach Award for Instrumentation Development to Mark Le Gros (Berkeley Lab) for developing an automated tomography station for x-ray microscopy of biological materials.

2. NOBEL-WINNING WORK SUPPORTED BY ALS RESEARCH

(Contact: TNEarnest@lbl.gov)

The recently announced 2003 Nobel Prize for Chemistry recognizes two scientists for "discoveries concerning channels in cell membranes." One of the co-recipients, Roderick MacKinnon, was cited "for structural and mechanistic studies of ion channels" involving protein crystallography work performed at several synchrotron light sources. MacKinnon, a professor at Rockefeller University in New York and an investigator of the Howard Hughes Medical Institute (HHMI), primarily works at the National Synchrotron Light Source (NSLS) in Brookhaven, NY, and the Cornell High Energy Synchrotron Source (CHESS) in Ithaca, NY. He is also a registered user of the ALS and the Berkeley Center for Structural Biology, having done work at Beamline 5.0.2 and, more recently, working at the HHMI-funded Beamline 8.2.2. Two ion-channel articles by MacKinnon's group acknowledge synchrotron support from the ALS: "Crystal structure and mechanism of calcium-gated potassium channel" [Jiang et al., Nature 417, 515 (2002)] and "The open pore conformation of potassium channels" [Jiang et al., Nature 417, 523 (2002)].

The other co-recipient, Peter Agre of Johns Hopkins University School of Medicine, was cited "for the discovery of water channels," a membrane protein he called aquaporin (AQP1), in 1992. In 2000 and 2001, the first high-resolution three-dimensional structures of AQP1 and a related glycerol-selective bacterial channel protein (GlpF) were reported. Two of the structure papers cited in the advanced information prepared by the Nobel Foundation involved work done at ALS Beamline 5.0.2: "Structure of a glycerol-conducting channel and the basis for its selectivity" [Fu et al., Science 290, 481 (2000)] and "Structural basis of water-specific transport through the AQP1 water channel" [Sui et al., Nature 414, 872 (2001)]. ALS highlights of these research papers can be found at http://www-als.lbl.gov/als/science/sci_archive/glycerol.html and http://www-als.lbl.gov/als/science/sci_archive/54aquaporin.html, respectively. According to the Nobel Foundation Web site, "This year's Prize illustrates how contemporary biochemistry reaches down to the atomic level in its quest to understand the fundamental processes of life."

3. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Jennifer Doudna
(Contact: doudna@uclink.berkeley.edu)

Congratulations and many thanks to Gerry McDermott, Eli Rotenberg, and the ALS staff for organizing a fantastic Users' Meeting! Last week's meeting featured many excellent talks and posters, several popular workshops, and of course the banquet and ALS awards ceremony at which this year's winners were honored. Read the meeting summary by Art Robinson for a full recap of the meeting's highlights.

As we discussed at the meeting, ALS users from the U.S. are encouraged to send letters in support of DOE funding to their congressional reps. All U.S. users were sent an email last week with detailed information about how to quickly prepare and send the letters. The UEC encourages everyone to participate and help raise the level of awareness of synchrotron research and funding in Washington.

As the year winds down, the UEC is once again seeking to elect new members to replace those of us who will rotate off the committee (Doudna and McDermott). Six nominees have agreed to run for election to the three slots we need to fill:

Clemens Heske (Univ. Wurzberg, Germany)
Jeffrey Kortright (Berkeley Lab)
Ronald Phaneuf (Univ. of Nevada, Reno)
Corie Ralston (Berkeley Lab)
Edwin Westbrook (Molecular Biology Consortium)
Wanli Yang (Berkeley Lab)

The voting deadline has been extended by one week to enable all users to familiarize themselves with the candidates. Please vote between October 21 and November 21 by going online to http://www-als.lbl.gov/als/uec/vote/ and clicking on "Vote." Thanks to all of you, and as always, please bring your concerns and comments about the ALS to your UEC.

4. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Hoi-Ying Holman (Berkeley Lab)
John Bradley (Lawrence Livermore National Laboratory)
Ted Raab (Carnegie Institution of Washington)

Beamline 4.0.2
Jeffrey Kortright (Berkeley Lab)
Boris Sinkovic (Univ. of Connecticut)
James Tobin (Lawrence Livermore National Laboratory)
Kai Liu (Univ. of California, Davis)

Beamlines 5.0.1, 5.0.2, 5.0.3
Jiandong Zhang, Joseph Kim, Rashid Syed (Amgen)
James Griffith, Marc Jacobs (Vertex Pharmaceuticals)
Wenqin Xu, Ye Zhu (Univ. of Washington)
Gyorgy Snell (Syrrx, Inc.)

Beamline 5.3.2
Gary Mitchell (The Dow Chemical Company)
Harald Ade (North Carolina State Univ.)
Adam Hitchcock (McMaster Univ., Canada)

Beamline 6.3.1
Hisanobu Wakita (Fukuoka Univ., Japan)
Maurizio Sacchi (Univ. Paris-Sud, France)

Beamline 7.0.1
James Allen (Univ. of Michigan)
M. Zahid Hasan (Princeton Univ.)
James Tobin (Lawrence Livermore National Laboratory)
Byron Freelon (Berkeley Lab)
Joseph Nordgren (Uppsala Univ., Sweden)

Beamline 7.3.1.1
Stephen Urquhart (Univ. of Saskatchewan, Canada)
Jo Stohr (Stanford Synchrotron Radiation Laboratory)

Beamline 7.3.3
Alain Manceau (Univ. Joseph Fourier, France)

Beamline 8.0.1
Eberhard Umbach (Univ. Wurzburg, Germany)
Manfred Neumann (Univ. of Osnabruck, Germany)
Karsten Kuepper (Univ. of Osnabruck, Germany)

Beamlines 8.2.1, 8.2.2
Hector Aldaz, Brian Kelch (Univ. of California, San Francisco)
Christopher Garcia, Alex Bankovich, Erin Adams (Stanford Univ.)
Joseph Mougous (Univ. of California, Berkeley)
Ashley Deacon, Jessica Chin, Inna Leim, Irimpan Mathews, Qingping Xu (Joint Center for Structural Genomics)

Beamline 8.3.1
Adrian Keating-Clay (Univ. of California, San Francisco)
Peter Hwang (Univ. of California, San Francisco)
William Harries, Shahram Khademi (Univ. of California, San Francisco)
Brian Chapados (The Scripps Research Institute)
Graeme Card, Abhinav Kumar (Plexxicon, Inc.)
Jamie Cate (Berkeley Lab)

Beamline 9.0.1
Chris Jacobsen (Stony Brook Univ.)

Beamline 9.3.2
Frank Ogletree (Berkeley Lab)
Allen Johnson (Univ. of Nevada, Las Vegas)

Beamline 10.0.1
Laurent Duda (Uppsala Univ., Sweden)
Z.X. Shen (Stanford Univ.)
James Allen (Univ. of Michigan)
Nora Berrah (Western Michigan Univ.)

5. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user runs of September 30 - October 5 and October 8 - 13, the beam reliability (time delivered/time scheduled) was 92%. Of the scheduled beam, 87% was delivered to completion

without interruption. The majority of lost time is attributable to several power supply problems and their repair.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

LBNL/PUB-875
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

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ALSNews Vol. 233 October 29, 2003

Contents of This Issue:

1. ANTIBIOTIC-RESISTANT RIBOSOME SHEDS LIGHT ON PROTEIN SYNTHESIS

by Lynn Yarris
(Contact: JCate@lbl.gov)

Protein crystallography images from the ALS have helped researchers make new determinations about the process by which proteins get synthesized from the genetic code. The researchers made their determinations by comparing images of ribosomes taken from normal strains of the bacterium Escherichia coli to those of a mutant antibiotic-resistant strain. Ribosomes are the organelles in living cells responsible for translating the genetic code into proteins. It is the first time that anyone has been able to compare the structural differences between the ribosomes of normal and antibiotic-resistant strains of E. coli. Such comparisons can help us learn more about the mechanisms behind protein synthesis.

Read the full story at
http://www-als.lbl.gov/als/science/sci_archive/68ecoli_ribosome.html.

Publication about this research: A. Vila-Sanjurjo, W.K. Ridgeway, V. Seymaner, W. Zhang, S. Santoso, K. Yu, and J.H. Doudna Cate, "X-ray crystal structures of the WT and a hyper-accurate ribosome from Escherichia coli," Proc. Natl. Acad. Sci. 100, 8682 (2003).

2. CONGRESSWOMAN HONORS ALS ON 10TH ANNIVERSARY

In tribute to the 10th Anniversary of the ALS, U.S. Representative Barbara Lee of California's Ninth District (which includes Berkeley Lab) inserted comments into the October 20, 2003, edition of the U.S. Congressional Record. In her remarks, she described the ALS as "one of our Nation's premier scientific research centers," and an "extraordinary tool" offering unprecedented opportunities for state-of-the-art research in materials science, biology, chemistry, physics, and the environmental sciences. "Since its inception in 1993," she said, "the ALS has been at the forefront of science. Among its many accomplishments, it has helped reveal how bacteria resist antibiotics, how inexpensive and efficient solar cells can be fabricated, and how strange substances like quasicrystals possess properties never before seen." Congresswoman Lee's full statement appears in Vol. 149 of the Congressional Record and can be viewed online by searching for page "E2090" at http://www.gpoaccess.gov/crecord/retrieve.html.

3. VOTE NOW FOR THREE NEW UEC MEMBERS

(Contact: AMGreiner@lbl.gov)

The 2003 UEC election is now in progress. Submit your vote online by going to http://www-als.lbl.gov/als/uec/vote/ and clicking on "Vote." To view the final slate of candidates and their biographical information, go to the above site and click on "View Candidate Bios." All ALS users with current email addresses on file in our user database are eligible to vote. The deadline for casting your vote is November 21, and the results will be posted November 25. The newly elected members will take office for a three-year term beginning January 1, 2004. Rotating off the committee at the end of 2003 are Jennifer Doudna (Univ. of California, Berkeley) and Gerry McDermott (Berkeley Lab).

4. REMINDER TO INTERNATIONAL USERS: REQUIRED DOCUMENTATION
(Contact: alsuser@lbl.gov)

All ALS researchers who are not U.S. citizens and who were either born in, or are nationals of, a sensitive country* or a state-sponsored terrorist nation* must notify the ALS User Services Office of their travel plans at least 90 days before their intended arrival date in the U.S. This will allow the User Services Office to prepare the paperwork necessary to comply with new Department of Energy guidelines for international researchers.

Upon arrival in the U.S., visiting researchers should be prepared to show immigration officials both their Letter of Invitation and their Letter of Support, as well as all other immigration papers (visa stamp, passport, I-94 application, etc.). Users who obtained their visa with the assistance of Lawrence Berkeley National Laboratory will have received both their invitation and support letters in advance.

*Countries falling into these categories are listed on the Web pages below:
http://www.lbl.gov/ehs/security/02intl_emp/countries_sens.html
http://www.lbl.gov/ehs/security/02intl_emp/countries_terr.html

5. PROPOSAL SCORES AND RUNNING SCHEDULE AVAILABLE ONLINE
(Contact: GFKrebs@lbl.gov)

The general sciences beamtime allocation process for the running period from December 2003 through May 2004 is complete. The number of proposals for the cycle was 213, up from 191 in the previous period. The number of eight-hour shift requests increased from 3932 to 4641, an increase of about 18%. A total of 1775 shifts, equal to about 38% of the total time requested in the proposals, were allocated. Competition for beam time on insertion-device beamlines was especially keen--requests for the insertion device beamlines will continue to find the proposal process for general users extremely competitive. For more detailed results, including beamline score distributions and cutoff scores, go to http://www-als.lbl.gov/als/quickguide/pspscores.html.

The schedule for the upcoming running period has also been posted on the web at http://www-als.lbl.gov/als/schedules/next_ltsch.html. Two-bunch operation will occur March 17 - 28 and a shutdown is scheduled for April 26 - June 10. The shutdown this year was extended an extra week in an effort to safely meet a fairly demanding schedule driven by the tasks of surveying and aligning the storage ring.

6. FIRST CALL: GENERAL SCIENCES PROPOSALS DUE DECEMBER 1
(Contact: alsproposals@lbl.gov)

The User Services Office is now accepting general user proposals from scientists who wish to

conduct research in the general sciences at the ALS during the running period from June to November 2004. The deadline for submissions is December 1, 2003. (This deadline does not apply to protein crystallography proposals, which have a separate process and schedule.)

Scientists wishing to renew a previous proposal must download the one-page "ALS Experiment Report and Request for Beamtime" form (see links below) and submit it to the User Services Office by the December 1 deadline. The form is in Rich Text Format (RTF) and can be saved to your hard disk, filled out, and attached in an email message to alsproposals@lbl.gov with the key words "Experiment Report" in the subject header. Proposals cannot be renewed for more than three cycles after they are first submitted. After three rollover cycles, a new proposal must be submitted. If your proposal is designated ALS-00893 or lower, then you must submit a new proposal to be eligible for beamtime.

The numeric rating for each proposal will be communicated to the user along with any comments that might have been added by the Proposal Study Panel. The cutoff rating for each beamline in the previous proposal cycle is published on the Web (see item 5 above). The following resources are available for further information:

ALS User Services Administrator
alsuser@lbl.gov

General user proposal process
http://www-als.lbl.gov/als/quickguide/independinvest.html

ALS General Sciences Proposal and Request for Beamtime
http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/Page1P.shtml/Initialize

ALS Experiment Report and Request for Beamtime (renewal form)
http://www-als.lbl.gov/als/quickguide/expt_report.rtf

Beamline information
http://www-als.lbl.gov/als/als_users_bl/datasheets.html
http://www-als.lbl.gov/als/als_users_bl/bl_table.html

Proposal Study Panel (PSP) scores
http://www-als.lbl.gov/als/quickguide/pspscores.html

7. WHO'S IN TOWN: A SAMPLING OF ALS USERS

The ALS will be operating at 1.5 GeV from October 28 through November 2. Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Jillian Banfield (Berkeley Lab)
John Bradley (Lawrence Livermore National Laboratory)
Ted Raab (Carnegie Institution of Washington)

Beamline 4.0.2
Stephen Cramer (Univ. of California, Davis, and Berkeley Lab)
Chuck Fadley (Univ. of California, Davis, and Berkeley Lab)

Beamlines 5.0.1, 5.0.2, 5.0.3
Robert Schoenlein (Berkeley Lab)

Kam Zhang (Plexxicon, Inc.)
William Somers (Wyeth-Ayerst Research)
Li-Wei Hung (TB Structural Genomics Consortium)
Elizabeth Getzoff (The Scripps Research Institute)
John Hart (Univ. of Texas Health Science Center at San Antonio)
Thomas Poulos (Univ. of California, Irvine)
Peter Hwang (Univ. of California, San Francisco)
Duncan McRee (Syrrx, Inc.)

Beamline 5.3.2
Harald Ade (North Carolina State Univ.)
Archie Smith (Columbian Chemicals Company)
Gary Mitchell (The Dow Chemical Company)
Adam Hitchcock (McMaster Univ., Canada)

Beamline 7.0.1
Steve Kevan (Univ. of Oregon)
Miquel Salmeron (Berkeley Lab)

Beamline 7.3.1.1
Jo Stohr (Stanford Synchrotron Radiation Laboratory)

Beamline 8.0.1
Alexander Moewes, Mikhail Iablonskikh (Univ. of Saskatchewan, Canada)
Dan Dessau (Univ. of Colorado at Boulder)
Jeffrey Kortright (Berkeley Lab)

Beamlines 8.2.1, 8.2.2
Richard Brennan (Oregon Health and Science Univ.)
Christopher Garcia (Stanford Univ.)
Ashley Deacon (Stanford Synchrotron Radiation Laboratory)
Axel Brunger (Stanford Univ.)
Steven Sprang (Univ. of Texas Southwestern Medical Center)
Pamela Bjorkman (California Institute of Technology)

Beamline 8.3.1
Joy Huffman (The Scripps Research Institute)
Tom Alber, James Berger (Univ. of California, Berkeley)
Shahram Khademi (Univ. of California, San Francisco)
Adrian Keatinge-Clay (Univ. of California, San Francisco)
Peter Hwang (Univ. of California, San Francisco)
Brian Kelch (Univ. of California, San Francisco)
Kevin Slep (Univ. of California, San Francisco)
Joel Credle (Univ. of California, San Francisco)
Stephanie Wang (Univ. of California, San Francisco)

Beamline 9.3.2
Suntharampillai Thevuthasan (Pacific Northwest National Laboratory)
Piero Pianetta (Stanford Synchrotron Radiation Laboratory)

Beamline 10.3.2
Andrei Istratov (Berkeley Lab)

8. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user runs of October 14 - 19 and 21 - 27, the beam reliability (time delivered/time scheduled) was 98%. Of the scheduled beam, 90% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

LBNL/PUB-875
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 234 November 12, 2003

Contents of This Issue:

1. STUDY REVEALS ORBITAL MIXING BETWEEN WATER AND DISSOLVED IONS

by Lori Tamura
(Contacts: lgm@physto.se, nilsson@SLAC.Stanford.EDU)

The essential role of water as a solvent in chemistry and biology is closely connected to the chemical interactions between dissolved ions and the water molecules immediately surrounding them (the "first hydration shell"). However, selectively measuring the electronic structure of such water molecules out of all the molecules in the solution has been a formidable challenge. With recent developments in soft x-ray absorption spectroscopy (XAS) applied to liquids under ambient conditions, such measurements are now possible. By combining these measurements, taken at ALS Beamline 8.0.1, with density functional theory (DFT) calculations, researchers from Sweden and the U.S. have demonstrated that the molecular orbitals of the water molecules in the first hydration shell will mix with the d orbitals of a dissolved transition-metal ion, resulting in characteristic pre-edge features in the oxygen 1s XAS spectrum. The technique is sensitive enough to easily detect an additional chlorine ion in the hydration shell.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/67orbitmix.html.

Publication about this research: L.-A. Naslund, M. Cavalleri, H. Ogasawara, A. Nilsson, L.G.M. Pettersson, P. Wernet, D.C. Edwards, M. Sandstrom, and S. Myneni, "Direct Evidence of Orbital Mixing between Solvated Transition-Metal Ions: An Oxygen 1s XAS and DFT Study of Aqueous Systems," J. Phys. Chem. A, 107, 6869 (2003).

2. DOE SECRETARY ANNOUNCES 20-YEAR SCIENCE FACILITY PLAN

U.S. Energy Secretary Spencer Abraham on Monday outlined the Department of Energy's Office of Science 20-year science facility plan, a roadmap for future scientific facilities to support the department's basic science and research missions. The plan prioritizes new, major scientific facilities and upgrades to current facilities. The 28 facilities cover the range of science supported by the DOE's Office of Science, including fusion energy, materials science, biological and environmental science, high energy physics, nuclear physics, and advanced scientific computation.

DOE's Office of Science prepared the list over the last year with input from the scientific community, DOE laboratories, and advisory committees. In brief, Office of Science program managers first identified 46 facilities they believed are required for world scientific leadership over the next 20 years. Six independent advisory committees reviewed the facilities, recommended 53 facilities for construction, and assessed each according to two criteria: scientific importance and

readiness for construction. Dr. Raymond L. Orbach, director of the Office of Science, prioritized the facilities across the scientific disciplines.

The list identifies 12 facilities as near-term priorities, eight facilities as midterm priorities, and eight as far-term priorities. The Linac Coherent Light Source is one of four facilities tied for near-term priority three. Upgrades to the National Synchrotron Light Source, the ALS, and the Advanced Photon Source, were all included as far-term priorities.

Links to Secretary Abraham's speech as well as a PDF version of the full report can be found at http://www.sc.doe.gov/Sub/Facilities_for_future/facilities_future.htm.

3. ALS DIVISION REVIEW BEGINS TODAY
(Contact: NVSmith@lbl.gov)

Today and tomorrow, the ALS will be presenting itself for review by a panel of experts from industry, academia, other national laboratories, and other synchrotron light sources. It is the third Berkeley Lab Director's Review of the ALS since it became a stand-alone laboratory division in 1997. Erwin Poliakoff (Louisiana State Univ.) will chair the review committee. Other committee members are Juan Carlos Campuzano (Univ. of Illinois at Chicago), John Hemminger (Univ. of California, Irvine), Eric Isaacs (Argonne National Laboratory), Janos Kirz (Stony Brook University), Hans Koufal (IBM), Peter Moore (Yale Univ.), and Jim Murphy (National Synchrotron Light Source).

Neville Smith will brief the panel on the growth of the ALS science program, and David Robin will provide an update on accelerator and upgrade developments. Ben Feinberg will provide an LDRD report and Steve Leone will discuss the LUX project. A selection of users will present overviews of their work: Alessandra Lanzara (Univ. of California, Berkeley, correlated materials), Richard Saykally (Univ. of California, Berkeley, x-ray spectroscopy of the liquid water surface), Dennis Lindle (Univ. of Nevada, Las Vegas, atomic, molecular, and optical physics), Jo Stohr (Stanford Synchrotron Radiation Laboratory, magnetic nanostructures and their dynamics), and Gerry McDermott (Berkeley Lab, protein crystallography). In addition, members of the committee will be given a tour of the facility and have lunch with representatives of the Users' Executive Committee.

4. REMINDER: GENERAL SCIENCES PROPOSALS DUE DECEMBER 1
(Contact: alsproposals@lbl.gov)

The User Services Office is still accepting general user proposals from scientists who wish to conduct research in the general sciences at the ALS during the running period from June to November 2004. The deadline for submissions is December 1, 2003. (This deadline does not apply to protein crystallography proposals, which have a separate process and schedule.) Scientists wishing to renew a previous proposal must download the one-page "ALS Experiment Report and Request for Beamtime" form (see links below) and submit it to the User Services Office by the December 1 deadline. Proposals cannot be renewed for more than three cycles after they are first submitted. The following resources are available for further information:

ALS User Services Administrator
alsuser@lbl.gov

General user proposal process
http://www-als.lbl.gov/als/quickguide/independinvest.html

ALS General Sciences Proposal and Request for Beamtime

http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/Page1P.shtml/Initialize

ALS Experiment Report and Request for Beamtime (renewal form)
http://www-als.lbl.gov/als/quickguide/expt_report.rtf

Beamline information
http://www-als.lbl.gov/als/als_users_bl/datasheets.html
http://www-als.lbl.gov/als/als_users_bl/bl_table.html

Proposal Study Panel (PSP) scores
http://www-als.lbl.gov/als/quickguide/pspscores.html

5. REMINDER: UEC ELECTION ENDS NOVEMBER 21

(Contact: AMGreiner@lbl.gov)

The Users' Executive Committee (UEC) election is now in progress. Submit your vote online by going to the UEC election Web site at http://www-als.lbl.gov/als/uec/vote/ and clicking on "Vote." More information about the election can be found at the site. Voting is to take place October 21 to November 21, and the results will be announced November 25.

6. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Hoi-Ying Holman (Berkeley Lab)
Ted Raab (Carnegie Institution of Washington)

Beamline 4.0.2
Chuck Fadley (Univ. of California, Davis, and Berkeley Lab)
Kai Liu (Univ. of California, Davis)
Jo Stohr (Stanford Synchrotron Radiation Laboratory)

Beamlines 5.0.1, 5.0.2, 5.0.3
Timothy Wood, David Barondeau (The Scripps Research Institute)
Sergio Martinez (Univ. of Washington)
Ernst Ter Haar (Vertex Pharmaceuticals)
Jinsong Liu, Athena Sudom, Olga Plotnikova, Zhulun Wang (Tularik, Inc.)
Deborah Mitchell, Novelle Kimmich, Jessica Schulz, Tyler Korman, John Purdon, Yicheng Hwang (Univ. of California, Irvine)
Mark Robien, Isolde Le Trong, Gye Won Han (Univ. of Washington)
Dominique Toppani, Brent Segelke, Timothy Lekin, Evan Bursey (TB Structural Genomics Consortium)
Mark Knapp, Armando Villasenor (Roche Bioscience)
Daniel Knighton, Robert Love, Hans Parge, Thomas Pauly, Samantha Greasley (Pfizer, Inc.)
Xiaoping Dai, Xueyong Zhu, Lan Xu, Dennis Wolan (The Scripps Research Institute)

Beamline 5.3.2
Adam Hitchcock (McMaster Univ., Canada)
Gary Mitchell (The Dow Chemical Company)
Stephen Urquhart (Univ. of Saskatchewan, Canada)

Harald Ade (North Carolina State Univ.)
Daniel Guay (Institut National de la Recherche Scientifique, Canada)

Beamline 6.1.2
Greg Denbeaux (State Univ. of New York, Albany)

Beamline 6.3.1
Krystyna Jablonska (Polish Academy of Sciences)

Beamline 7.0.1
Jim Tobin (Lawrence Livermore National Laboratory)
Karsten Horn (Fritz-Haber-Institute, Germany)
Joseph Nordgren (Uppsala Univ., Sweden)

Beamline 7.3.1.1
Luc Thomas (IBM Almaden Research Center)
Z.Q. Qiu (Univ. of California, Berkeley)

Beamline 8.0.1
Dan Dessau (Univ. of Colorado at Boulder)
Jeffrey Kortright (Berkeley Lab)
Richard Saykally (Univ. of California, Berkeley)

Beamlines 8.2.1, 8.2.2
Mark Robien, Isolde Le Trong, Gye Won Han (Univ. of Washington)
Ti Li, Sergio Martinez (Univ. of Washington)
Feng Guo, Anne Gooding, Aidong Han, Alexei Kazantsev (Univ. of Colorado at Boulder)
Duilio Cascio, Sum Chan, Michael Sawaya, Salem Faham, Sarah Yohannan (Univ. of California, Los Angeles)

Beamline 8.3.1
Bill Harries, Shahram Khademi, David Akhavan (Univ. of Califonia, San Francisco)
Ho-Leung Ng (Univ. of California Berkeley)
Emmanuel Skordalakes (Univ. of California, Berkeley)
Xiaoping Dai, Xueyong Zhu, Lan Xu, Dennis Wolan (The Scripps Research Institute)
Magnar Bjoras, Ottar Sundheim (The Scripps Research Institute)
Hu Pan (Univ. of California, San Francisco)
Hector Aldaz (Univ. of California, San Francisco)
Adrian Keatinge-Clay (Univ. of California, San Francisco)
Evette Radisky (Univ. of California, Berkeley)
Anton Vila-Sanjurjo, Barbara Schuwirth (Univ. of California, Berkeley)

Beamline 9.0.1
John Spence (Berkeley Lab)

Beamline 9.3.2
Piero Pianetta (Stanford Synchrotron Radiation Laboratory)
Frank Ogletree (Berkeley Lab)
Philip Ross (Berkeley Lab)

Beamline 10.3.2
Alain Manceau (Univ. Joseph Fourier, France)
Deborah Aruguete (Berkeley Lab)

7. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

Jan Pusina will be the new Operations group leader, replacing Bruce "Sam" Samuelson, who retired this month. For the user runs of October 28 - November 2 (1.5-GeV operation) and November 5 - 10, the beam reliability (time delivered/time scheduled) was 98%. Of the scheduled beam, 96% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Jan Pusina (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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LBNL/PUB-875
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 235 November 26, 2003

Contents of This Issue:

1. GLYCOPROTEIN RECEPTOR YIELDS CLUES TO PLATELET "STICKINESS"

by Art Robinson
(Contact: jdumas@wyeth.com)

Glycoprotein Ib alpha (GpIb alpha), a receptor on the surface of platelets in the blood, binds to several signaling molecules including thrombin, an enzyme released from damaged tissue that is required for blood clotting. Abnormal (both too much and too little) GpIb alpha - thrombin binding is associated with many pathological conditions, including the formation of blood clots that can cause heart attacks and strokes by blocking arteries (thrombosis) and bleeding disorders such as hemophilia. To gain insight into the adhesive mechanism by which platelet receptors regulate formation of a blood clot, a group from Wyeth Research working at the ALS has determined the crystal structure of a key portion of the GpIb alpha receptor in complex with thrombin.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/69platelet.html

Publication about this research: J.J. Dumas, R. Kumar, J. Seehra, W.S. Somers, and L. Mosyak, "Crystal structure of the GpIb alpha-thrombin complex essential for platelet aggregation," Science 301, 222 (2003).

2. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Jennifer Doudna
(Contact: doudna@uclink.berkeley.edu)

Greetings from the UEC, and thanks to all of you who voted for new UEC representatives in our recent election. Congratulations to our new members, Clemens Heske (University of Wurzburg, Germany), Corie Ralston (Berkeley Center for Structural Biology, Berkeley Lab) and Ed Westbrook (Molecular Biology Consortium), who will begin service on the UEC in January 2004. Many exciting changes are ahead, with the planned ALS upgrades beginning soon and the new user housing and research facilities on the horizon. The UEC continues to work with user organizations at other synchrotrons to encourage federal funding for national laboratories and to raise public awareness of synchrotron research. As always, we welcome user input and feedback. Happy Thanksgiving!

3. LAST CALL: GENERAL SCIENCES PROPOSALS DUE DECEMBER 1

(Contact: alsproposals@lbl.gov)

December 1, 2003, is the deadline for general user proposals in the general sciences for the running period from June to November 2004. (This deadline does not apply to protein crystallography proposals, which have a separate process and schedule.)

Scientists wishing to renew a previous proposal must download the one-page "ALS Experiment Report and Request for Beamtime" form (see links below) and submit it to the User Services Office by the December 1 deadline. The following resources are available for further information:

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http://www-als.lbl.gov/als/quickguide/expt_report.rtf

Beamline information
http://www-als.lbl.gov/als/als_users_bl/datasheets.html
http://www-als.lbl.gov/als/als_users_bl/bl_table.html

Proposal Study Panel (PSP) scores
http://www-als.lbl.gov/als/quickguide/pspscores.html

4. SRI 2003 PRESENTATIONS, USERS' MEETING PHOTOS POSTED ONLINE

Presentations from the Eighth International Conference on Synchrotron Radiation Instrumentation (SRI 2003) have been posted online as PDF files (go to http://www.sri2003.lbl.gov/html/presentations.html). SRI 2003 was jointly hosted this year by the Stanford Synchrotron Radiation Laboratory and the ALS and was held August 25 - 29, 2003, at Yerba Buena Center for the Arts in downtown San Francisco. Also, photos and a brief report on the 2003 ALS Users' Meeting, held October 6 - 8 in Berkeley, have been posted (go to http://www-als.lbl.gov/als/usermtg/).

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 4.0.2
Stephen Cramer (Univ. of California, Davis, and Berkeley Lab)

Beamline 5.3.2
Gary Mitchell (The Dow Chemical Company)
Harald Ade (North Carolina State Univ.)
Adam Hitchcock (McMaster Univ., Canada)
Arthur Kilcoyne (Berkeley Lab)

Beamline 7.0.1

Steve Kevan (Univ. of Oregon)

Beamline 8.0.1
Oliver Hemmers (Univ. of Nevada, Las Vegas)
Wayne Stolte (Univ. of Nevada, Las Vegas)

Beamline 10.0.1
Dan Dessau (Univ. of Colorado at Boulder)
Z.X. Shen (Stanford Univ.)

Beamline 10.3.2
Vittal Yachandra (Berkeley Lab)

Beamline 11.0.1
Miquel Salmeron (Berkeley Lab)
David Shuh (Berkeley Lab)

6. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of November 11 - 17 and 19 - 25, the beam reliability (time delivered/time scheduled) was 99%. Of the scheduled beam, 93% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Jan Pusina (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

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ALSNews Vol. 236 December 10, 2003

Contents of This Issue:

1. WHY ALCOHOL AND WATER DON'T MIX

by Jinghua Guo, Lynn Yarris, and Lori Tamura
(Contacts: JGuo@lbl.gov, luo@theochem.kth.se)

Devotees of scotch and water should be advised they may never attain the perfect blend. A group of scientists has used x-ray absorption and selectively excited x-ray emission spectroscopy at the ALS to study the electronic states of liquid water mixed with the simplest type of alcohol, methanol. While methanol is not used in beverages (it's actually a poison), its molecular behavior when mixed with water is expected to be the same as that of ethanol, the drinkable form of alcohol. Beyond advances in mixology, however, the ability to determine the mixing properties of different liquids is of great importance: many vital chemical and biological processes take place in aqueous solutions. The emission spectra obtained in this study reveal that the water and alcohol molecules in solution form complex hydrogen-bonded networks and mix very little at the microscopic level. The results illustrate the technique's potential to provide new and valuable information about the microscopic origins of the properties of liquids and solutions.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/70methanolmix.html

Publication about this research: J.-H. Guo, Y. Luo, A. Augustsson, S. Kashtanov, J.-E. Rubensson, D.K. Shuh, H. Agren, and J. Nordgren, "The Molecular Structure of Alcohol-Water Mixtures," Phys. Rev. Lett. 91, 157401 (2003).

2. SAC MEETING SCHEDULED FOR DECEMBER 16 - 17

(Contact: NVSmith@lbl.gov)

The ALS Scientific Advisory Committee (SAC) will convene at the ALS on Tuesday, December 16, and Wednesday, December 17. The SAC is charged with advising Berkeley Lab and ALS management on issues relating to ALS operations, resource allocation, and strategic planning. The agenda for the first day includes discussions of the ALS upgrade, the latest superbend beamlines, and plans for Beamline 9.0. The second day's agenda includes a discussion of nanoscience at the ALS and other administrative matters. The presentations will be open to all (except for executive sessions at the end of both days), and users are especially invited to attend the ALS upgrade session on Tuesday from 9:45 a.m. to 12:30 p.m. in Room 6-2202. Current members of the advisory committee are listed online (go to http://www-als.lbl.gov/als/ourorg/sac.html).

3. BERKELEY LAB CELEBRATES ALS AND NCEM ANNIVERSARIES

Berkeley Lab yesterday celebrated the milestones achieved this year by two of its most distinguished national user facilities. To honor the 20th anniversary of the National Center for Electron Microscopy (NCEM) and the 10th anniversary of the ALS, the Lab held a special program of talks that reflected upon the history and the future of both facilities. Two individuals who played major roles in the development of the centers--NCEM founding scientist Gareth Thomas and ALS Project Director Jay Marx--waxed nostalgic while current NCEM Director Uli Dahmen and ALS Deputy for Science Neville Smith discussed current strategies and plans. The celebration also included employee tours of the two facilities and a commemorative section published in the employee newspaper (available online at http://www.lbl.gov/Publications/Currents/Archive/Dec-05-2003.html).

4. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Jennifer Doudna
(Contact: doudna@uclink.berkeley.edu)

As this year draws to a close, the UEC looks ahead to exciting developments in 2004. The ALS upgrades are moving forward as planned, and to facilitate input from a broad spectrum of the community, a group comprising beamline scientists and users, including UEC members John Bozek and Eli Rotenberg, has agreed to work directly with ALS management. To help ensure a smooth transition, as well as provide a forum for user discussions, a UEC website is being created, and it should come online soon. And the UEC continues to plan future lobbying efforts in Washington and with our congressional representatives to raise public awareness of, and support for, synchrotron research.

I am delighted to have had the opportunity to work with so many talented and dedicated people at the ALS over the past year. The leadership of the UEC will be rotating into the able hands of Dennis Lindle, incoming chair, and Greg Denbeaux, the incoming Vice Chair, and I will continue to work with the UEC in an ex-officio role as we prepare for the year ahead. Happy holidays!

5. LATEST ACTIVITY REPORT NOW POSTED ONLINE

(Contact: AMGreiner@lbl.gov)

A PDF version of the 2002 ALS Activity Report has been posted online (go to http://www-als.lbl.gov/als/actrep). The Activity Report is published annually and illustrates the depth and breadth of the ALS scientific program with a selection of research results. The 2002 edition contains feature articles on the spectroscopy of water and the growth of the protein crystallography program at the ALS. The report also summarizes operations, ongoing R&D, educational outreach efforts, and special events. Printed copies will be mailed to all users in the ALS database within the next couple of weeks. Others can request a copy by sending email to alsuser@lbl.gov. Be sure to include your name, complete mailing address, and the name of the publication being requested.

6. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Hoi-Ying Holman (Berkeley Lab)
Jonathan Castro (Oberlin College)
Mandana Veiseh (Univ. of Washington)

Beamline 4.0.2
Stephen Cramer (Univ. of California, Davis, and Berkeley Lab)
Boris Sinkovic (Univ. of Connecticut)
Yves Idzerda (Montana State Univ.)
Chuck Fadley (Univ. of California, Davis, and Berkeley Lab)

Beamlines 5.0.1, 5.0.2, 5.0.3, 8.2.1
Ashley Deacon, Irimpan Mathews, Mitchell Miller, Hsiu-Ju Chiu, Inna Levin, Qingping Xu (Stanford Synchrotron Radiation Laboratory)
Ed Berry, Li-Shar Huang (Berkeley Lab)
Marc Jacobs (Vertex Pharmaceuticals)
Rashid Syed, Jiandong Zhang (Amgen)
Vaheh Oganesyan (Berkeley Lab)
Marty Boulanger, Jennifer Maynard, Huijing Shi (Stanford Univ.)

Beamline 5.3.2
Adam Hitchcock (McMaster Univ., Canada)
Harald Stover (McMaster Univ., Canada)
Harald Ade (North Carolina State Univ.)
Daniel Guay (Institut National de la Recherche Scientifique, Canada)
Gary Mitchell (The Dow Chemical Company)

Beamline 6.1.2
Greg Denbeaux (Univ. at Albany, State Univ. of New York)
Jeffrey Kortright (Berkeley Lab)
Carolyn Larabell (Berkeley Lab)

Beamline 7.3.1.1
Z.Q. Qiu (Univ. of California, Berkeley)

Beamline 7.3.3
Ersan Ustundag (California Institute of Technology)

Beamline 9.0.2
Terrill Cool (Cornell Univ.)

Beamline 9.3.2
Philip Ross (Berkeley Lab)
Piero Pianetta (Stanford Synchrotron Radiation Laboratory)
Bongjin Mun (Berkeley Lab)

Beamline 10.0.1
David Pegg (Univ. of Tennessee)
Duane Jaecks (Univ. of Nebraska-Lincoln)
Z.-X. Shen (Stanford Univ.)
Gey-Hong Gweon (Berkeley Lab)
Alessandra Lanzara (Univ. of California, Berkeley)
Xinjiang Zhou (Stanford Synchrotron Radiation Laboratory)

Beamline 10.3.2
John Bargar (Stanford Synchrotron Radiation Laboratory)
Yuji Arai (U.S. Geological Survey)
Phoebe Lam (Berkeley Lab)

7. HOLIDAY CLOSURE SCHEDULE

Berkeley Lab will close on the evening of December 23 and reopen on the morning of January 2. During the closure, the Lab will shut down as much heating and ventilating equipment as possible to reduce costs. The first user run of 2003 will be January 7 - 11. The next issue of ALSNews will be published on January 28. Have a happy holiday season, and we'll see you next year!

8. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user run of December 3 - 7, the beam reliability (time delivered/time scheduled) was 99%. Of the scheduled beam, 92% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/schedules/index.html). Requests for special operations use of the "scrubbing" shift should be sent to Jan Pusina (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/.

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Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

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